



# STIC Search Report

## EIC 1700

STIC Database Tracking Number: 146876

TO: Sin J Lee  
Location: REM 9D60  
Art Unit : 1752  
March 15, 2005

Case Serial Number: 09/992560/C

From: Kathleen Fuller  
Location: EIC 1700  
REMSEN 4B28  
Phone: 571/272-2505  
Kathleen.Fuller@uspto.gov

### Search Notes

✓ 146876



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader  
571/272-2505 REMSEN 4B28

## Voluntary Results Feedback Form

- I am an examiner in Workgroup:  Example: 1713  
➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

*Types of relevant prior art found:*

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



## SEARCH REQUEST FORM

## Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 2-24-05  
 Art Unit: 1752 Phone Number 302-1333 Serial Number: 091942,560  
 Mail Box and Bldg/Room Location: 9D64 Results Format Preferred (circle): PAPER DISK E-MAIL  
 (Rem)

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

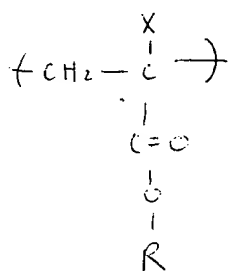
Title of Invention: Bib attached

Inventors (please provide full names): \_\_\_\_\_

Pat. & T.M. Office  
 Earliest Priority Filing Date: \_\_\_\_\_

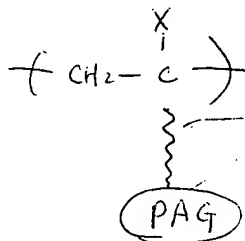
\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for the following polymer:



(R = any alkyl)

(X = -CH<sub>3</sub> or H)



any kind of linking gp. or a single bond

(PAG is a (photo)acid generating component)

either sulfonic acid or carboxylic acid

## STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>J. Fuller</u>	NA Sequence (#) _____	STN <u>✓</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>4</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr.Link _____
Date Completed: <u>3/15/05</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>20</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>20</u>	Other _____	Other (specify) _____

=> FILE REG

FILE 'REGISTRY' ENTERED AT 11:07:15 ON 15 MAR 2005  
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provided by InfoChem.

STRUCTURE FILE UPDATES: 14 MAR 2005 HIGHEST RN 845540-96-7  
DICTIONARY FILE UPDATES: 14 MAR 2005 HIGHEST RN 845540-96-7

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

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Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more  
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<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> FILE HCAPL

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FILE COVERS 1907 - 15 Mar 2005 VOL 142 ISS 12  
FILE LAST UPDATED: 14 Mar 2005 (20050314/ED)

This file contains CAS Registry Numbers for easy and accurate  
substance identification.

=> D QUE

L1 STR

6 5  
G1 O  
> ||  
CH2: C—C—O  
1 2 3 4

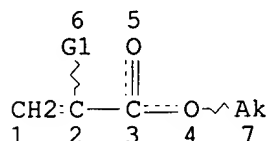
VAR G1=H/CH3/CL  
NODE ATTRIBUTES:

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 6

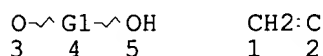
STEREO ATTRIBUTES: NONE  
L3 SCR 2043  
L5 279001 SEA FILE=REGISTRY SSS FUL L1 AND L3  
L32 STR 1



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NODE ATTRIBUTES:  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE  
L48 STR 2



VAR G1=S/C  
NODE ATTRIBUTES:  
CONNECT IS M2 RC AT 2  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE  
L51 91041 SEA FILE=REGISTRY SUB=L5 SSS FUL L32 AND L48  
L52 5392 SEA FILE=REGISTRY ABB=ON L51 AND 2/NC  
L53 15807 SEA FILE=HCAPLUS ABB=ON L52  
L54 1565 SEA FILE=HCAPLUS ABB=ON L53(L)?RESIST?  
L55 536 SEA FILE=HCAPLUS ABB=ON L54 AND REPROG?/SC  
L56 6 SEA FILE=HCAPLUS ABB=ON L55 AND NANO?  
L57 190 SEA FILE=HCAPLUS ABB=ON L55 AND LITHOG?  
L58 46 SEA FILE=HCAPLUS ABB=ON L57 AND (RESOLU? OR RESOLV?)  
L59 51 SEA FILE=HCAPLUS ABB=ON L58 OR L56

=> D L59 BIB ABS IND HITSTR 1-51

L59 ANSWER 1 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 2002:799453 HCAPLUS

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

*5,392 polymers from  
structures 1 and 2,  
limited to 2 components*

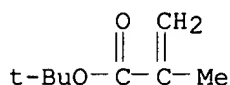
DN 138:409230  
 TI Dissolution characteristics of resist polymers studied by quartz crystal microbalance transmission-line analysis and pKa acidity analysis  
 AU Toriumi, Minoru; Itami, Toshiro; Yamashita, Jun; Sekine, Tomomi; Nakatani, Kiyoharu  
 CS Adv. Technol. Res. Dep., Semiconductor Leading Edge Technologies, Inc., Yokohama Kanagawa, Japan  
 SO Proceedings of SPIE-The International Society for Optical Engineering (2002), 4690(Pt. 2, Advances in Resist Technology and Processing XIX), 904-911  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 AB The development process is very important in determining the resist **resolution** of **lithog**. Polymer dissoln. during development was studied based on resonance frequency and impedance measured by the quartz crystal microbalance (QCM) method. A transmission-line anal. of QCM data was then carried out. The dissoln. characteristics were also evaluated from the standpoint of mol. structures and polymer acidity measured by potentiometric titration. Fluoropolymers showed dissoln. characteristics which reflect large fluorine effects in addition to acidity effects. The fluorine effects retarded the dissoln. rates and formed a swelling layer. Poly(methacrylate)s had a complicated swelling behavior during development owing to the hydrophobic components in the polymers. The fluorine and hydrophobic effects rather than polymer acidity play the dominant role in forming the swelling layer during development.  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
 ST dissoln characteristic resist polymer quartz crystal microbalance; transmission line acidity analysis dissoln characteristic photoresist polymer  
 IT Acidity  
 Dissolution  
 Microbalances  
 Photoresists  
 (dissoln. characteristics of photoresist polymers studied by quartz crystal microbalance transmission-line anal. and pKa acidity anal.)  
 IT Fluoropolymers, properties  
 RL: PRP (Properties)  
 (dissoln. characteristics of photoresist polymers studied by quartz crystal microbalance transmission-line anal. and pKa acidity anal.)  
 IT Functional groups  
 (hydroxylhexafluoroisopropyl; dissoln. characteristics of photoresist polymers studied by quartz crystal microbalance transmission-line anal. and pKa acidity anal.)  
 IT 75-59-2, Tetramethylammonium hydroxide  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (developer; dissoln. characteristics of photoresist polymers studied by quartz crystal microbalance transmission-line anal. and pKa acidity anal.)  
 IT 24979-70-2, Poly(p-hydroxystyrene) **35343-63-6**, Methacrylic acid-tert-butyl methacrylate copolymer  
 RL: PRP (Properties)  
 (dissoln. characteristics of **photoresist** polymers studied by quartz crystal microbalance transmission-line anal. and pKa acidity anal.)  
 IT **35343-63-6**, Methacrylic acid-tert-butyl methacrylate copolymer  
 RL: PRP (Properties)

(dissoln. characteristics of **photoresist** polymers studied by quartz crystal microbalance transmission-line anal. and pKa acidity anal.)

RN 35343-63-6 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

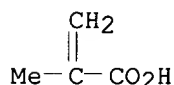
CM 1

CRN 585-07-9  
 CMF C8 H14 O2



CM 2

CRN 79-41-4  
 CMF C4 H6 O2



RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 2 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 2002:647876 HCAPLUS  
 DN 137:330980  
 TI Electron beam **lithography** of microbowtie structures for next-generation optical probe  
 AU Tseng, Ampere A.; Chen, Chii D.; Wu, C. S.; Diaz, Rodolfo E.; Watts, Michael E.  
 CS Department of Mechanical & Aerospace Engineering, Arizona State University, Tempe, AZ, 85287-6106, USA  
 SO Journal of Microlithography, Microfabrication, and Microsystems (2002), 1(2), 123-135  
 CODEN: JMMMGF; ISSN: 1537-1646  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 AB The development of microbowtie structures for a next-generation optical probe called the Wave Interrogated Near-Field Array (WINFA) is presented. The WINFA combines the sensitivity of near-field detection with the speed of optical scanning. The microbowties are designed to act as resonant elements to provide spatial **resolution** well below the diffraction limit with a transmission efficiency approaching unity. Following an introduction of the concept and background information, the design of the microbowtie is presented. A numerical electromagnetic scattering model is developed and used for better designs of the bow-tie structures. The electron-beam **lithog.** process is then used to fabricate the final designed bowties structure. Special fabrication procedures have

been developed to cope with the charge dissipation problem that arises when **lithographing** an insulating substrate as is required in the present probe design. Two types of substrates and two types of resists are considered in the present study. The fabricated microstructures have 40 nm bow-tie gaps that are more than 200 000 times smaller than the one built previously. All fabricated bow-tie microstructures are examined and the results are compared. It has been found that, in addition to the relative ease in fabrication, the bowties on indium-tin-oxide coated glass substrate can not only minimize the charge accumulation in a glass substrate, but also satisfy the functional requirement of optical transparency to the incident wave. Recommendations for making a bow-tie structure in the even smaller bow-tie array are also included.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

Section cross-reference(s): 73, 76

ST electron beam **lithog** microbowtie structure next generation optical probe

IT Optical glass

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(crown, substrate; direct-write electron-beam **lithog**.

fabrication of transparent microbowtie structures for next-generation optical probe using Ito-cotad glass and resist layer or trilayer resist on glass)

IT Semiconductor devices

(direct-write electron-beam **lithog**. fabrication of microbowtie structures for next-generation optical probe for imaging inspection of wafers)

IT Electron beam **lithography**

Microstructure

(direct-write electron-beam **lithog**. fabrication of transparent microbowtie structures for next-generation optical probe)

IT Surface defects

(direct-write electron-beam **lithog**. fabrication of transparent microbowtie structures for next-generation optical probe for inspection of material surfaces)

IT Testing of materials

(nondestructive; direct-write electron-beam **lithog**. fabrication of microbowtie structures for next-generation optical probe for imaging inspection)

IT Optical glass

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(substrate; direct-write electron-beam **lithog**. fabrication of transparent microbowtie structures for next-generation optical probe using Ito-cotad glass and resist layer or trilayer resist on glass)

IT 50926-11-9, Indium tin oxide

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(direct-write electron-beam **lithog**. fabrication of transparent microbowtie structures for next-generation optical probe)

IT 9011-14-7, PMMA

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(direct-write electron-beam **lithog**. fabrication of transparent microbowtie structures for next-generation optical probe for inspection of material surfaces)

IT 7440-21-3, Silicon, processes



RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(substrate; direct-write electron-beam **lithog.** fabrication of transparent microbowtie structures for next-generation optical probe using Ito-cotad glass and resist layer or trilayer resist on glass)

IT 7440-56-4, Germanium, processes **25086-15-1**, Poly(methacrylic acid-methyl methacrylate)

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(trilayer **resist** structure; direct-write electron-beam **lithog.** fabrication of transparent microbowtie structures for next-generation optical probe using trilayer **resist** on glass)

IT **25086-15-1**, Poly(methacrylic acid-methyl methacrylate)

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(trilayer **resist** structure; direct-write electron-beam **lithog.** fabrication of transparent microbowtie structures for next-generation optical probe using trilayer **resist** on glass)

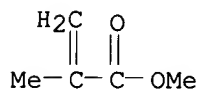
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

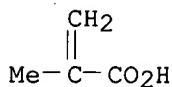
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 3 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:402263 HCAPLUS

DN 137:70444

TI Testing of the photopolymerizable photoresists

AU Treushnikov, Valeri M.; Victorova, Elena A.

CS Reper NN, Ltd., Nizhnii Novgorod, 603022, Russia

SO Internet Photochemistry & Photobiology [online computer file] (2000), 3rd, No pp. given

CODEN: IPPHFO; ISSN: 1470-1782

URL: <http://www.photobiology.com/photobiology2000/treush/index.htm>

PB Internet Photochemistry and Photobiology

DT Journal; (online computer file)

LA English

AB Three aspect of the photopolymerizable photoresist testing were studied. They are: (1) the correct determination of light sensitivity and **resolution** of the photoresist layers; (2) the problem of possible estimation of the internal parameters of the systems on the basis of determination their characteristic and sensitometric curves; (3) finding of the relationship between the light sensitivity and **resolution** of the layers and their composition and structural dynamical properties. Main requirements that must be imposed on the photoresist composition giving an opportunity to obtain maximal **resolution** are formulated.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photopolymerizable **lithog** photoresist sensitometric characteristics testing

IT Polymerization

Polymerization catalysts

(photopolymn.; photosensitivity of photopolymerizable photoresist layers in relation to layer composition and structural-dynamic properties of these layers)

IT Photolysis

Photoresists

Simulation and Modeling, physicochemical

(photosensitivity of photopolymerizable photoresist layers in relation to layer composition and structural-dynamic properties of these layers)

IT 583-63-1, o-Quinone

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(inhibitor; photosensitivity of photopolymerizable photoresist layers in relation to layer composition and structural-dynamic properties of these layers)

IT 22499-12-3, Isobutyl benzoin ether 24650-42-8, 2,2-

Dimethoxyphenylacetophenone

RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)

(initiator; photosensitivity of photopolymerizable photoresist layers in relation to layer composition and structural-dynamic properties of these layers)

IT 109-16-0, TGM-3 **26284-14-0**, Butyl methacrylate-methacrylic acid copolymer

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(photosensitivity of photopolymerizable **photoresist** layers in relation to layer composition and structural-dynamic properties of these layers)

IT **26284-14-0**, Butyl methacrylate-methacrylic acid copolymer

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(photosensitivity of photopolymerizable **photoresist** layers in relation to layer composition and structural-dynamic properties of these layers)

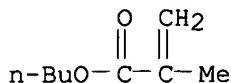
RN 26284-14-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with butyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 97-88-1

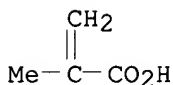
CMF C8 H14 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 4 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:330778 HCAPLUS

DN 137:39240

TI Studying on electron beam lithography technology

AU Liu, Yugui; Wang, Weijun; Luo, Siwei; Jiang, Zeliu; Pu, Jiliang

CS Hebei Semiconductor Research Institute, Shijiazhuang, 050002, Peop. Rep. China

SO Proceedings - International Conference on Solid-State and Integrated  
Circuit Technology, 6th, Shanghai, China, Oct. 22-25, 2001 (2001), Volume  
1, 472-474. Editor(s): Li, Bing-Zong. Publisher: Institute of Electrical  
and Electronics Engineers, New York, N. Y.  
CODEN: 69CNW6; ISBN: 0-7803-6520-8

DT Conference

LA English

AB The authors developed a method to obtain T-gate submicron structures using  
Leica VB-5HR electron-beam lithog. system, tri-layer resists, and several  
levels of exposure dose assignments, and applied this method to fabricate  
GaAs microwave and millimeter wave devices and integrated circuits. Also,  
the authors fabricated fine lines of submicron to **nano**-level,  
and obtained the golden lifted-off features of 17 nm.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)

Section cross-reference(s): 73, 76

ST submicron structure fabrication electron beam lithog; gallium arsenide  
microwave millimeter wave device electron beam lithog

IT Electron beam lithography  
Microwave devices

(fabrication of T-gate submicron structures using Leica VB-5HR  
electron-beam lithog. system with tri-layer resist)

IT Integrated circuits

(fabrication of T-gate submicron structures using Leica VB-5HR  
electron-beam lithog. system with tri-layer resist in relation to)

IT 1303-00-0, Gallium arsenide, processes  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
 (fabrication of T-gate submicron structures using Leica VB-5HR electron-beam lithog. system with tri-layer resist)

IT 25086-15-1, Methacrylic acid-methyl methacrylate copolymer  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
 (middle layer; fabrication of T-gate submicron structures using Leica VB-5HR electron-beam lithog. system with tri-layer **resist**)

IT 9011-14-7, PMMA  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
 (top and bottom layer; fabrication of T-gate submicron structures using Leica VB-5HR electron-beam lithog. system with tri-layer resist)

IT 25086-15-1, Methacrylic acid-methyl methacrylate copolymer  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
 (middle layer; fabrication of T-gate submicron structures using Leica VB-5HR electron-beam lithog. system with tri-layer **resist**)

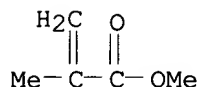
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

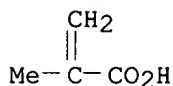
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 5 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:82309 HCAPLUS

DN 136:142611

TI Positive-working radiation-sensitive resist composition

IN Senoo, Masahide; Tamura, Kazutaka; Nio, Hiroyuki

PA Toray Industries, Inc., Japan

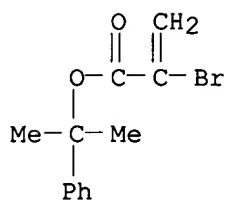
SO Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

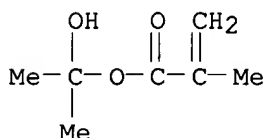
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002031891	A2	20020131	JP 2000-216050	20000717
PRAI	JP 2000-216050		20000717		
AB	The composition comprises a polymer having repeating units CH <sub>2</sub> CX(CO <sub>2</sub> A) and CH <sub>2</sub> CY(CO <sub>2</sub> B) (X = Cl-6 alkyl, halo, cyano; A is an organic group containing an aromatic ring. and is bonded with O through tertiary C; Y = Cl-6 alkyl, H, halo, cyano; when X = alkyl, B = C2-16 organic group containing secondary or tertiary alc. OH group; when X = halo or cyano, B = Cl-16 organic group containing primary, secondary, or tertiary alc. OH group) and an acid generator. The composition provides high <b>resolution</b> and sensitivity and is especially suitable for patterning semiconductor integrated circuits, <b>lithog.</b> masks, etc.				
IC	ICM G03F007-039				
	ICS C08F220-16; C08F220-42; C08K005-00; C08L033-14; C08L033-22; H01L021-027				
CC	74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other <b>Reprographic</b> Processes) Section cross-reference(s): 76				
ST	pos working radiation sensitive resist compn hydroxyl acrylate copolymer				
IT	Electron beam resists Semiconductor device fabrication: X-ray resists (pos.-working radiation-sensitive resist composition containing OH group-containing acrylate copolymer)				
IT	66003-78-9, Triphenylsulfonium triflate RL: TEM (Technical or engineered material use); USES (Uses) (acid generator; pos.-working radiation-sensitive resist composition containing OH group-containing acrylate copolymer)				
IT	393178-18-2, 2-Hydroxybutyl methacrylate-1-methyl-1-phenylethyl methacrylate copolymer 393178-19-3, 1,1-Diphenylethyl methacrylate-2-hydroxy-2-methylpropyl methacrylate copolymer 393178-20-6, 2-Hydroxyethyl methacrylate-1-methyl-1-phenylethyl- $\alpha$ -chloroacrylate copolymer 393178-21-7 <b>393178-22-8</b> 393178-23-9, 2-Hydroxyethyl methacrylate-1-methyl-1-phenylethyl- $\alpha$ -cyanoacrylate copolymer 393178-24-0, 2-Hydroxypropyl methacrylate-1-methyl-1-phenylethyl- $\alpha$ -cyanoacrylate copolymer 393178-27-3, 1,1-Diphenylethyl- $\alpha$ -cyanoacrylate-p-(1-hydroxy-1-methylethyl)phenyl methacrylate copolymer RL: TEM (Technical or engineered material use); USES (Uses) (pos.-working radiation-sensitive <b>resist</b> composition containing OH group-containing acrylate copolymer)				
IT	<b>393178-22-8</b> RL: TEM (Technical or engineered material use); USES (Uses) (pos.-working radiation-sensitive <b>resist</b> composition containing OH group-containing acrylate copolymer)				
RN	393178-22-8 HCAPLUS				
CN	2-Propenoic acid, 2-bromo-, 1-methyl-1-phenylethyl ester, polymer with 1-hydroxy-1-methylethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)				
CM	1				
CRN	334474-43-0				
CMF	C12 H13 Br O2				



CM 2

CRN 2791-00-6

CMF C7 H12 O3



- L59 ANSWER 6 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 2001:893616 HCAPLUS  
 DN 136:175377  
 TI **Nanometer** scale patterning of Langmuir-Blodgett films of gold **nanoparticles** by electron beam lithography  
 AU Werts, Martinus H. V.; Lambert, Mathieu; Bourgoïn, Jean-Philippe; Brust, Mathias  
 CS Service de Chimie Moleculaire, CEA/Saclay, Gif-sur-Yvette, F-91191, Fr.  
 SO Nano Letters (2002), 2(1), 43-47  
 CODEN: NALEFD; ISSN: 1530-6984  
 PB American Chemical Society  
 DT Journal  
 LA English  
 AB Electron beam lithog. on Langmuir-Blodgett films of alkanethiol-capped gold **nanoparticles** is shown to be a viable strategy to define **nanometer** scale structures of such particles. Sub-50 nm wide "**nanowires**", the thickness of which is controlled at the single particle level, are created with e-beam doses in the mC/cm<sup>2</sup> range. It is shown that the patterns are formed by radiation-induced crosslinking of the alkyl chains and that they can be contacted and studied elec.  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
 Section cross-reference(s): 76  
 ST electron lithog Langmuir Blodgett film alkanethiol capped gold **nanoparticle**  
 IT Electron beam lithography  
 Langmuir-Blodgett films  
**Nanoparticles**  
 (electron-beam lithog. on Langmuir-Blodgett films of alkanethiol-capped gold **nanoparticles**)  
 IT Self-assembly  
 (electron-beam lithog. on Langmuir-Blodgett films of gold **nanoparticles** covers with self-assembling monolayers of alkanethiol)

IT 111-31-9, n-Hexanethiol 112-55-0, n-Dodecanethiol 7440-57-5, Gold, processes  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
 (electron-beam lithog. on Langmuir-Blodgett films of alkanethiol-capped gold **nanoparticles**)

IT 9011-14-7, PMMA **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (lithog. fabrication of four probe electrodes including electron-beam patterning of Langmuir-Blodgett films of alkanethiol-capped gold **nanoparticles** and **resist** bilayer containing)

IT 75-79-6, Methyltrichlorosilane 919-30-2, Aminopropyltriethoxysilane 999-97-3, Hexamethyldisilazane 7440-21-3, Silicon, uses 7631-86-9, Silica, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (wafer; electron-beam lithog. on Langmuir-Blodgett films of alkanethiol-capped gold **nanoparticles** on silanized silica/silicon wafer)

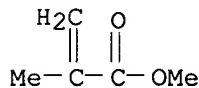
IT **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (lithog. fabrication of four probe electrodes including electron-beam patterning of Langmuir-Blodgett films of alkanethiol-capped gold **nanoparticles** and **resist** bilayer containing)

RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

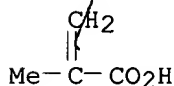
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 7 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

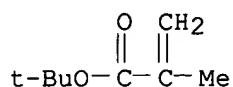
AN 2001:378883 HCAPLUS

DN 135:160083

TI Crosslinkable positive-tone photoresist comprising polymers with pendant carboxyl groups

AU Liu, Jui-Hsiang; Shi, Chih-Hung; Chen, We-Tin  
 CS Department of Chemical Engineering, National Cheng Kung University,  
 Tainan, 70101, Taiwan  
 SO Journal of Applied Polymer Science (2001), 81(4), 1014-1020  
 CODEN: JAPNAB; ISSN: 0021-8995  
 PB John Wiley & Sons, Inc.  
 DT Journal  
 LA English  
 AB Poly(methacrylic acid-co-t-butylmethacrylate-co-bornyl methacrylate) was  
 synthesized and its application to a crosslinkable pos. photoresist was  
 investigated. The existence of pendant alicyclic bornyl groups increased  
 the thermostability of copolymers; however, a decrease in the  
 acid-catalyzed deprotection of pendant t-Bu groups led to a decrease in  
 the sensitivity of the pos.-tone photoresist. The thermostability of the  
 relief polymeric patterns of the pos.-tone photoresist was appreciably  
 improved effectively because of the acid-catalyzed dehydration  
 crosslinking of pendant carboxyl groups. Thermogravimetric properties of  
 binder resins, exposure characteristics, and sensitivity and  
**resolution** of the photoresist were all investigated. **Lithog.**  
 . evaluation of the curable pos.-tone photoresists was also estimated  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic Processes**)  
 Section cross-reference(s): 35, 38  
 ST acrylic polymer photoresist pendant carbonyl; thermal stability  
 photoresist  
 IT IR spectra  
 Photoresists  
 Thermal stability  
 (crosslinkable pos.-tone photoresist comprising polymers with pendant  
 carboxyl groups)  
 IT **35343-63-6P**, Methacrylic acid-tert-butyl methacrylate copolymer  
 352454-65-0P  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN  
 (Synthetic preparation); TEM (Technical or engineered material use); PREP  
 (Preparation); PROC (Process); USES (Uses)  
 (crosslinkable pos.-tone **photoresist** comprising polymers with  
 pendant carboxyl groups)  
 IT 174804-72-9P  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN  
 (Synthetic preparation); TEM (Technical or engineered material use); PREP  
 (Preparation); PROC (Process); USES (Uses)  
 (crosslinked; crosslinkable pos.-tone photoresist comprising polymers  
 with pendant carboxyl groups)  
 IT **35343-63-6P**, Methacrylic acid-tert-butyl methacrylate copolymer  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN  
 (Synthetic preparation); TEM (Technical or engineered material use); PREP  
 (Preparation); PROC (Process); USES (Uses)  
 (crosslinkable pos.-tone **photoresist** comprising polymers with  
 pendant carboxyl groups)  
 RN 35343-63-6 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl  
 2-methyl-2-propenoate (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 585-07-9  
 CMF C8 H14 O2

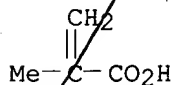




CM 2

CRN 79-41-4

CMF C4 H6 O2



RE.CNT 19. THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 8 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:541590 HCAPLUS

DN 133:303348

TI Bilayer, **nanoimprint lithography**

AU Faircloth, Brian; Rohrs, Henry; Tiberio, Richard; Ruoff, Rodney;  
Krchnavek, Robert R.

CS Nuvonyx, Inc., Bridgeton, MO, 63044, USA

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer  
Structures (2000), 18(4), 1866-1873

CODEN: JVTBD9; ISSN: 0734-211X

PB American Institute of Physics

DT Journal

LA English

AB **Nanoimprint lithog.** has been shown to be a viable means of patterning polymer films in the sub-100 nm range. In this work, we demonstrate the use of a bilayer resist to facilitate the metal liftoff step in imprinter fabrication. The bilayer resist technol. exhibits more uniform patterns and fewer missing features than similar metal **nanoparticle** arrays fabricated with single layer resist. The bilayer resist relies upon the differential solubility between poly(Me methacrylate) and poly(Me methacrylate methacrylic acid copolymer). Evidence is presented that shows the technique has a **resolution** of better than 10 nm.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

Section cross-reference(s): 38

ST **nanoimprint lithog** bilayer acrylic resist

IT Etching

Resists

Vapor deposition process

(bilayer-resist **nanoimprint lithog.**)

IT Sputtering

Sputtering

(etching, reactive; bilayer-resist **nanoimprint lithog** .)

IT Fluoropolymers, uses

RL: NUU (Other use, unclassified); USES (Uses)

(hyperbranched, mold release agent; bilayer-resist **nanoimprint lithog.**)

IT Etching  
(plasma; bilayer-resist **nanoimprint lithog.**)

IT Etching  
Etching  
(sputter, reactive; bilayer-resist **nanoimprint lithog**  
.)

IT **Lithography**  
(submicron; bilayer-resist **nanoimprint lithog.**)

IT **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
engineered material use); PROC (Process); USES (Uses)  
(bilayer-resist **nanoimprint lithog.**)

IT 7440-02-0, Nickel, processes  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
engineered material use); PROC (Process); USES (Uses)  
(dot **nanoarray**; bilayer-resist **nanoimprint**  
**lithog.**)

IT 67-56-1, Methanol, processes 75-73-0, Tetrafluoromethane 108-90-7,  
Chlorobenzene, processes 1333-74-0, Hydrogen, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(etchant; bilayer-resist **nanoimprint lithog.**)

IT 67-64-1, Acetone, uses 75-09-2, Methylene chloride, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(liftoff soaking agent; bilayer-resist **nanoimprint**  
**lithog.**)

IT 7440-47-3, Chromium, processes  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
engineered material use); PROC (Process); USES (Uses)  
(**nanoarray**; bilayer-resist **nanoimprint**  
**lithog.**)

IT 7782-44-7, Oxygen, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(plasma etching; bilayer-resist **nanoimprint lithog**  
.)

IT 7440-21-3, Silicon, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(substrate; bilayer-resist **nanoimprint lithog.**)

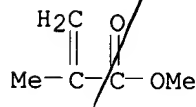
IT **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
engineered material use); PROC (Process); USES (Uses)  
(bilayer-resist **nanoimprint lithog.**)

RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)

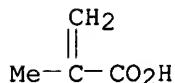
CM 1

CRN 80-62-6  
CMF C5 H8 O2



CM 2

CRN 79-41-4  
CMF C4 H6 O2



RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

- L59 ANSWER 9 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1999:467456 HCAPLUS  
DN 131:206850  
TI Chemically amplified negative resists based on alicyclic acrylate polymers for 193-nm **lithography**  
AU Iwasa, Shigeyuki; Maeda, Katsumi; Hasegawa, Etsuo  
CS Functional Materials Research Laboratories, NEC Corporation, Kanagawa, 216-8555, Japan  
SO Journal of Photopolymer Science and Technology (1999), 12(3), 487-492  
CODEN: JSTEED; ISSN: 0914-9244  
PB Technical Association of Photopolymers, Japan  
DT Journal  
LA English  
AB We have evaluated the effects of polymer structure on chemical amplified neg. resists in terms of alkaline solubility, adhesion, and **lithog.** performance. Poly(hydroxytricyclo [5.2.1.0<sup>2,6</sup>]decyl acrylate (TCDAOH)67 - carboxytetracyclo[4.4.0.12,517,10]dodecyl acrylate (CTCDDA)33) exhibits sufficient alkaline solubility (dissoln. rate (DR): 0.56  $\mu\text{m/s}$  in 2.38 wt% TMAH solution) for use as a neg. resist polymer, and a resist based on this polymer provides 0.17  $\mu\text{m}$  line-and-space (L/S) **resolution**. By way of contrast, poly(TCDAOH60-CTCDDA40) (D.R.: 0.95  $\mu\text{m/s}$ ) dose not provide good **resolution** because the developer permeates into the pattern. To improve adhesion, we have developed three new acrylate monomers: 3,4-epoxytricyclo[5.2.1.0<sup>2,6</sup>]decyloxyethyl acrylate (ETCDEA), 5-acryloyloxy-6-hydroxynorbornane-2-carboxylic 6-lactone (AHNCL), and 3,4-dihydroxy tricyclo[5.2.1.0<sup>2,6</sup>]decyloxyethyl (meth)acrylate (DTCDE(M)A). A resist based on poly(TCDAOH64-CTCDDA31-DTCDEA5) provided a 0.15- $\mu\text{m}$ - **resolution** isolated line pattern, and a resist based on poly(ETCDEA42-CTCDDA32-AHNCL26) provided a 0.13- $\mu\text{m}$ - **resolution** isolated line pattern. Both patterns were free of pattern stripping.
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
Section cross-reference(s): 35, 37
- ST chem amplified neg resist alicyclic acrylate polymer **lithog**  
IT Epoxy resins, properties  
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
(alicyclic; chemical amplified neg. resists based on alicyclic acrylate polymers for 193-nm **lithog.**)
- IT Adhesion, physical  
Dissolution rate  
**Lithography**  
(chemical amplified neg. resists based on alicyclic acrylate polymers for 193-nm **lithog.**)
- IT Resists  
(neg.-working; chemical amplified neg. resists based on alicyclic acrylate polymers for 193-nm **lithog.**)

IT 242136-37-4 242136-38-5 242136-39-6 242136-40-9 **242136-41-0**  
 RL: PRP (Properties); TEM (Technical or engineered material use); USES  
 (Uses)  
 (chemical amplified neg. **resists** based on alicyclic acrylate  
 polymers for 193-nm **lithog.**)

IT 113382-79-9 140919-17-1 140919-18-2 242129-35-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (chemical amplified neg. **resists** based on alicyclic acrylate polymers for  
 193-nm **lithog.**)

IT 211377-75-2  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (chemical amplified neg. **resists** based on alicyclic acrylate polymers for  
 193-nm **lithog.**)

IT 17464-88-9  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (crosslinker; chemical amplified neg. **resists** based on alicyclic acrylate  
 polymers for 193-nm **lithog.**)

IT 66003-78-9, Triphenylsulfonium triflate  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (photoacid; chemical amplified neg. **resists** based on alicyclic acrylate  
 polymers for 193-nm **lithog.**)

IT **242136-41-0**  
 RL: PRP (Properties); TEM (Technical or engineered material use); USES  
 (Uses)  
 (chemical amplified neg. **resists** based on alicyclic acrylate  
 polymers for 193-nm **lithog.**)

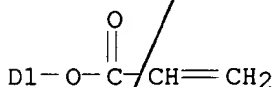
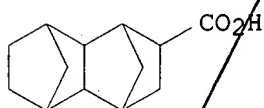
RN 242136-41-0 HCAPLUS  
 CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, decahydro-6(or  
 7)-[(1-oxo-2-propenyl)oxy]-, polymer with 2-[(octahydro-2,5-methano-2H-  
 indeno[1,2-b]oxirenyl)oxy]ethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 195398-52-8

CMF C16 H20 O4

CCI IDS

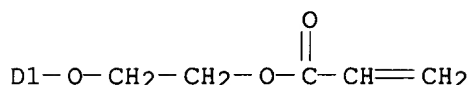
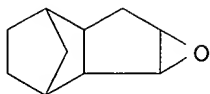


CM 2

CRN 113382-79-9

CMF C15 H20 O4

CCI IDS



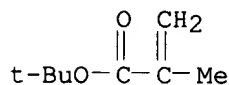
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 10 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1998:776503 HCAPLUS  
DN 130:160499  
TI The design and study of water-soluble positive- and negative-tone imaging materials  
AU Havard, Jennifer M.; Pasini, Dario; Frechet, Jean M. J.; Medeiros, David; Patterson, Kyle; Yamada, Shintaro; Willson, C. Grant  
CS Department of Chemistry, University of California-Berkeley, Berkeley, CA, 94720-1460, USA  
SO Proceedings of SPIE-The International Society for Optical Engineering (1998), 3333(Pt. 1, Advances in Resist Technology and Processing XV), 111-121  
CODEN: PSISDG; ISSN: 0277-786X  
PB SPIE-The International Society for Optical Engineering  
DT Journal  
LA English  
AB The interest in imaging materials with improved environmental characteristics led one to consider imaging formulations coated from and developed in aqueous media, thus avoiding the need for both organic solvents and basic aqueous developer solns. The authors have previously reported on the design of several neg.-tone resists operating via radiation-induced crosslinking, and while the performance of these neg.-tone systems met the basic goals, the **resolution** that could be achieved was limited due to swelling occurring during development. The authors now report on various other designs based on polyoxazoline, poly(vinyl alc.), and methacrylate resins that circumvent this problem with approaches towards both neg.- and pos.-tone systems.  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
ST design water soluble neg pos polymer photoresist **lithog** imaging  
IT Photoresists  
(design and study of water-soluble polyoxazolin-based pos.- and neg.-tone polymers for chemical amplified photoresists)  
IT Photoimaging  
(polymeric; design and study of water-soluble polyoxazolin-based pos.- and neg.-tone polymers for chemical amplified photoresists)  
IT 10471-78-0D, 2-Isopropenyl-2-oxazoline, polymers 214149-86-7  
214149-87-8 220159-50-2 220159-53-5  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(design and study of water-soluble polyoxazoline-based pos.- and neg.-tone polymers for chemical amplified photoresists)

- IT 2210-25-5, N-Isopropylacrylamide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (design and study of water-soluble polyoxazoline-based pos.- and neg.-tone polymers for chemical amplified photoresists)
- IT 35343-63-6, tert-Butyl methacrylate-methacrylic acid copolymer  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (design and study of water-soluble pos.- and neg.-tone imaging methacrylate polymers for chemical amplified photoresists)
- IT 7732-18-5, Water, processes 57840-38-7, Triphenylsulfonium hexafluoroantimonate 180787-54-6 214149-84-5  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (design and study of water-soluble pos.- and neg.-tone imaging polymers for chemical amplified photoresists)
- IT 9002-89-5D, Poly(vinyl alcohol), hydrolyzed, reaction product with di-tert-Bu dicarbonate 24424-99-5D, Di-tert-butyl dicarbonate, reaction products with hydrolyzed poly(vinyl alc.)  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (design and study of water-soluble pos.- and neg.-tone imaging polymers for chemical amplified photoresists)
- IT 35343-63-6, tert-Butyl methacrylate-methacrylic acid copolymer  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (design and study of water-soluble pos.- and neg.-tone imaging methacrylate polymers for chemical amplified photoresists)
- RN 35343-63-6 HCAPLUS
- CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

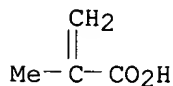
CM 1

CRN 585-07-9  
 CMF C8 H14 O2



CM 2

CRN 79-41-4  
 CMF C4 H6 O2



RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 11 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1998:470302 HCAPLUS  
 DN 129:223136

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

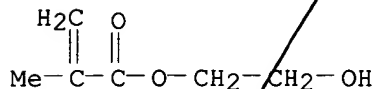
- TI A new family of non-chemically amplified resists  
 AU Aviram, Ari; Angelopoulos, Marie; Babich, Edward; Babich, Inna; Petrillo, Karen; Seeger, David  
 CS IBM Research Division, T.J. Watson Research Center, Yorktown Hts., NY, 10598, USA  
 SO Proceedings of SPIE-The International Society for Optical Engineering (1998), 3331(Emerging Lithographic Technologies II), 349-358  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 AB Non-chemical amplified resists offer advantages over chemical-amplified (CA) resists because they are less susceptible to temperature variations and contaminants. In order for non-CA resists to be viable, they have to perform **lithog.** at an equivalent level with the CA resists from the points of view of quantum yield, **resolution**, and etch resistance. We report here on new non-CA resists based on polymer esters that undergo deesterification to the corresponding acids upon exposure to UV, x-ray and e-beam radiation. The efficiency of the radiation reaction is surprisingly high. The resulting poly acids are base soluble and can be employed as pos. working resists. The resists are composed of polymers and copolymers of methacrylate esters. The sensitivity of one derivative to x-ray is 75 mJ/cm<sup>2</sup> and to e-beam is 1.0  $\mu$ C/cm<sup>2</sup> at 10 KV. Best **resolution** obtained was 125 nm with x-ray radiation.  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
 Section cross-reference(s): 38, 76  
 ST **lithog** resist polyester deesterification; UV exposure polyester resist deesterification; electron beam exposure polyester resist deesterification; x ray exposure polyester resist deesterification  
 IT Absorption spectra  
 Electron beams  
**Lithography**  
 Photochemistry  
 Resists  
 Saponification  
 UV radiation  
 X-ray  
 (new family of non-chemical amplified resists)  
 IT Polyesters, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (new family of non-chemical amplified resists)  
 IT **31693-08-ODP**, 2-Hydroxyethyl methacrylate-methacrylic acid copolymer, reaction product with N,N-Diethylformamide  
 RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (new family of non-chemical amplified **resists**)  
 IT 617-84-5D, N,N-Diethylformamide, reaction product with 2-Hydroxyethyl methacrylate homopolymer  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (new family of non-chemical amplified resists)  
 IT 25087-26-7, Methacrylic acid homopolymer 25249-16-5, 2-Hydroxyethyl methacrylate homopolymer  
 RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)  
 (new family of non-chemical amplified resists)  
 IT **31693-08-ODP**, 2-Hydroxyethyl methacrylate-methacrylic acid copolymer, reaction product with N,N-Diethylformamide  
 RL: PNU (Preparation, unclassified); TEM (Technical or engineered material

use); PREP (Preparation); USES (Uses)  
(new family of non-chemical amplified **resists**)

RN 31693-08-0 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with 2-hydroxyethyl  
2-methyl-2-propenoate (SCI) (CA INDEX NAME)

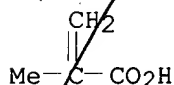
CM 1

CRN 868-77-9  
CMF C6 H10 O3



CM 2

CRN 79-41-4  
CMF C4 H6 O2



RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 12 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1998:334773 HCAPLUS  
DN 129:74054  
TI Transparent resins, photosensitive resin compositions containing the same  
suitable for **lithography**, and manufacture of semiconductor  
devices having high-**resolution** resist patterns using the same  
IN Kumata, Teruhiko; Sasahara, Atsuko; Oshida, Atsushi; Yoshida, Ikuhiro;  
Adachi, Hiroshi  
PA Mitsubishi Electric Corp., Japan  
SO Jpn. Kokai Tokkyo Koho, 12 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10140018	A2	19980526	JP 1996-293852	19961106
PRAI	JP 1996-293852		19961106		
AB	The title compns. highly sensitive in short wavelength region (e.g., ArF excimer laser, etc.) and durability to dry etching comprise resins having m-R1C6H4R2 group (R1 = CO, SO2; R2 = CO2R3, COR3, NO2, NO, CN, CF3, R42S+ X-, R34N+ X-; R3 = H, C1-10 hydrocarbyl; R4 = H, C1-4 hydrocarbyl; X = F, Cl, I, tosyl, mesityl, triflyl) and acid-decomposable group and compds. generating acids upon light irradiation				
IC	ICM C08L101-02 ICS G03F007-039; G03F007-20; H01L021-027				
CC	74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other				



**Reprographic Processes)**

Section cross-reference(s): 76

ST photoresist semiconductor device

IT Photoresists

Semiconductor devices

Transparent materials

(transparent resins, photosensitive resin compns. containing the same suitable for lithog., and manufacture of semiconductor devices having high-resolution resist patterns using the same)

IT 209049-45-6P 209049-46-7P 209049-48-9P 209049-50-3P

209049-52-5P 209049-54-7P 209049-56-9P 209049-57-0P

209049-58-1P 209049-59-2P 209049-61-6P 209049-63-8P

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM

(Technical or engineered material use); PREP (Preparation); USES (Uses)

(transparent resins, photosensitive resin compns. containing the same suitable for lithog., and manufacture of semiconductor devices having high-resolution resist patterns using the same)

IT 209049-46-7P 209049-58-1P

RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM

(Technical or engineered material use); PREP (Preparation); USES (Uses)

(transparent resins, photosensitive resin compns. containing the same suitable for lithog., and manufacture of semiconductor devices having high-resolution resist patterns using the same)

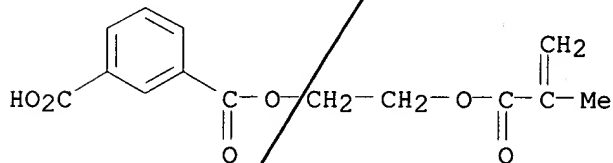
RN 209049-46-7 HCAPLUS

CN 1,3-Benzenedicarboxylic acid, mono[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl] ester, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 87700-99-0

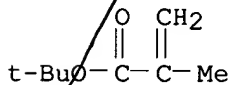
CMF C14 H14 O6



CM 2

CRN 585-07-9

CMF C8 H14 O2



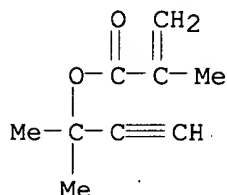
RN 209049-58-1 HCAPLUS

CN 1,3-Benzenedicarboxylic acid, mono[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl] ester, polymer with 1,1-dimethyl-2-propynyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 141550-36-9

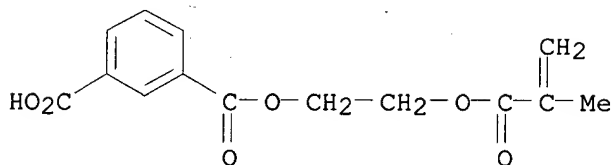
CMF C9 H12 O2



CM 2

CRN 87700-99-0

CMF C14 H14 O6



L59 ANSWER 13 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:705335 HCAPLUS

DN 128:28521

TI Novel resist and exposure strategy for high-resolution electron-beam lithography

AU Daumann, Walter; Bertenburg, Ralf M.; Van Den Berg, Christoph; Tegude, Franz-Josef

CS Solid-State Electronics Department, Gerhard-Mercator-University Duisburg, Sonderforschungsbereich SFB 254, Duisburg, D-47057, Germany

SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3155 (Charged Particle Optics III), 155-162

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

AB We will present a new resist and exposure strategy applicable to the fabrication of sub-micron gate-length heterostructure field-effect transistors (HFET) with T-shaped (mushroom) gate contacts. Using selected polymethylmethacrylate (PMMA) resists as well as copolymers (polymethylmethacrylate/methacrylic acid: PMMA/MAA) and by optimization of the layer thicknesses we have established an electron-beam lithog. process for fabrication of 0.1 μm mushroom-gates. Main advantages of this new concept are the necessity of low accelerating voltages of only ≤ 10 kV as well as an adapted thickness of the resist stack which, furthermore, guarantees a large cross-sectional area and hence, low contact resistance. Addnl., an excellent lift-off behavior is obtained. Due to the low accelerating voltage any standard scanning electron microscope can be applied for sub-micron mushroom-gate lithog. which drops

costs drastically. The complete fabrication process including gate-recess etching shows an excellent reproducibility which guarantees good process control and high yield. The achieved results are comparable with well established T-gate processes, thus this new concept should be directly applicable in standard process lines. It should be pointed out that all exposure parameters become almost independent of the substrate property, because the dissipation volume is completely located within the resist layer stack. Thus, the contribution of backscattered electrons to the total dose is negligible.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

Section cross-reference(s): 76

ST resist **lithog** heterostructure field effect transistor; high

IT **resoln** electron beam **lithog** HFET

IT Etching

(gate-recess etching in fabrication of 0.1  $\mu\text{m}$  mushroom-gates)

IT Process control

(good process control and high yield in fabrication of 0.1  $\mu\text{m}$  mushroom-gates)

IT Thickness

(optimization of PMMA and PMMA/MAA resist layer thicknesses for electron-beam **lithog.** process for fabrication of 0.1  $\mu\text{m}$  mushroom-gates)

IT Field effect transistors

Resists

(resist and exposure strategy for fabrication of sub-micron gate-length heterostructure field-effect transistors with T-shaped gate contacts)

IT Electron beam **lithography**

(resist and exposure strategy in high-**resolution** electron-beam **lithog.**)

IT 9011-14-7, PMMA **25086-15-1**, Methylmethacrylate-methacrylic acid copolymer

RL: TEM (Technical or engineered material use); USES (Uses)

(electron-beam **lithog.** process for fabrication of 0.1  $\mu\text{m}$  mushroom-gates using selected PMMA and PMMA/MAA **resists**)

IT **25086-15-1**, Methylmethacrylate-methacrylic acid copolymer

RL: TEM (Technical or engineered material use); USES (Uses)

(electron-beam **lithog.** process for fabrication of 0.1  $\mu\text{m}$  mushroom-gates using selected PMMA and PMMA/MAA **resists**)

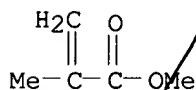
RN **25086-15-1** HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

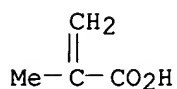
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 14 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:471374 HCAPLUS

DN 127:227273

TI Chemically amplified resist based on high etch-resistant polymers for  
193-nm **lithography**

AU Nakano, Kaichiro; Maeda, Katsumi; Iwasa, Shigeyuki; Hasegawa, Etsuo

CS Functional Devices Research Laboratories, NEC Corporation, Kawasaki, 216,  
Japan

SO Journal of Photopolymer Science and Technology (1997), 10(4), 561-570  
CODEN: JSTEOW; ISSN: 0914-9244

PB Technical Association of Photopolymers, Japan

DT Journal

LA English

AB This paper describes the properties of our new alicyclic-methacrylate  
polymer, poly(carboxy-tetracyclo[4.4.0.12,5.17,10]dodecyl methacrylate)  
(poly(CTCDDMA)), which was designed as a base polymer for the resist for  
ArF excimer laser **lithog**. The etching rate of the polymer for  
chlorine plasma was 1.15 times that for a novolak-based resist, indicating  
a higher etching durability than that of poly(p-vinylphenol). We also  
studied the adhesion properties of an alicyclic-methacrylate polymer by  
estimating the work of adhesion using poly(carboxy-  
tricyclo[5.2.1.02,6]decylmethyl methacrylate) (poly(CTCDMA)). We found  
that the adhesion decreased with an increase in the protection ratio for  
the polymer, and 60% tert-Bu protection caused stripping and collapse of  
the resist pattern in the standard developer, 2.38% tetramethylammonium  
hydroxide (TMAH) aqueous solution. We obtained appropriate adhesion using a  
diluted

TMAH aqueous solution as a developer and found that a proper  
developer-concentration

could be determined using the work of adhesion of a polymer. Addnl., we  
confirmed that introducing a  $\geq 20\%$  hydroxy-  
tricyclodecyl(meth)acrylate (TCD(M)AOH) unit into the polymer raised the  
work of adhesion to 74.0mN/m, which was higher than that of the  
novolak-based resist (73.5mN/m). This made possible the pattern  
**resolution** of a poly(CTCDMA)-based resist in the standard developer. We  
obtained a 0.35- $\mu\text{m}$  pattern using a resist based on a terpolymer containing  
TCDAOH and the standard developer. The chemical amplified resist composed of a  
33% ethoxyethyl-protected poly(CTCDDMA) and N-hydroxysuccinimide tosylate  
**resolved** a 0.15- $\mu\text{m}$  L&S pattern at a dosage of 21.8 mJ/cm<sup>2</sup>, with  
an ArF prototype lens (NA = 0.55) and using a 0.024% TMAH developer.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)

ST chem amplified resist etch resistant polymer; etch resistant polymer  
excimer laser **lithog**

IT Adhesion, physical

Dissolution rate

Etching

Photolithography

Photoresists

(chemical amplified resist based on high etch-resistant polymers for excimer laser lithog.)

IT 75-11-6, Methylene iodide 7732-18-5, Water, properties  
RL: PRP (Properties)  
(calcn. of surface free energy for polymer using surface tension values of water and methylene iodide)

IT 171439-99-9 184856-64-2 195131-22-7 195131-24-9 **195131-25-0**  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(chemical amplified **resist** based on high etch-**resistant** polymers for excimer laser lithog.)

IT 75-59-2, Tetramethylammonium hydroxide  
RL: TEM (Technical or engineered material use); USES (Uses)  
(developer; chemical amplified resist based on high etch-resistant polymers for excimer laser lithog.)

IT 7782-50-5, Chlorine, processes 10035-10-6, Hydrogen bromide, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(etchant; chemical amplified resist based on high etch-resistant polymers for excimer laser lithog.)

IT 6066-82-6, N-Hydroxysuccinimide 66003-78-9, Triphenylsulfonium triflate  
RL: TEM (Technical or engineered material use); USES (Uses)  
(photoacid generator; chemical amplified resist based on high etch-resistant polymers for excimer laser lithog.)

IT **195131-25-0**  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(chemical amplified **resist** based on high etch-**resistant** polymers for excimer laser lithog.)

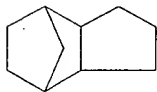
RN 195131-25-0 HCAPLUS  
CN 4,7-Methano-1H-indenecarboxylic acid, octahydro[[ (2-methyl-1-oxo-2-propenyl)oxy)methyl]-, polymer with octahydrohydroxy-4,7-methano-1H-indenyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

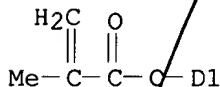
CRN 195131-23-8

CMF C14 H20 O3

CCI IDS



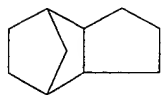
D1-OH



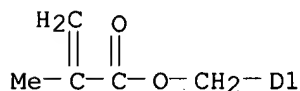
CM 2

CRN 184856-56-2

CMF C16 H22 O4  
CCI IDS



D1-CO<sub>2</sub>H

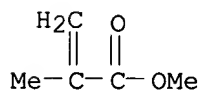


- L59 ANSWER 15 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1995:829569 HCAPLUS  
DN 124:18228  
TI Multilayer process of T-shaped transistor gates for GaAs-pseudomorphic HEMTs using electron-beam resist technology and i-line negative resist with optical stepper **lithography**  
AU Schneider, Joachim; Becker, Fred; Glorer, Karlheinz; Weismann, Birgit; Muenzel, Norbert  
CS Fraunhofer-Institute Applied Solid State Physics, Freiburg/Br., D-79108, Germany  
SO Proceedings of SPIE-The International Society for Optical Engineering (1995), 2438(Advances in Resist Technology and Processing XII), 717-25 CODEN: PSISDG; ISSN: 0277-786X  
PB SPIE-The International Society for Optical Engineering  
DT Journal  
LA English  
AB A novel process for the fabrication of T-gates (mushroom gates) with a base dimension of 0.2  $\mu\text{m}$  (gate length) and a top dimension of 0.6  $\mu\text{m}$  is presented. A two-layer resist system, in which first the bottom of the gate structure was patterned with a one-layer electron-beam (e-beam) resist P(MMA/MAA) and then the top of the structure was patterned with an optical wafer stepper exposure and development of an exptl. i-line neg. resist (LMB 7011). The crosslinked bottom resist (prebake temperature 170°C) was exposed with Leica e-beam system EBPG-5HR. The top resist was patterned with i-line wafer stepper ASM-L 2500/40. For this exposure a rim phase shift reticle was used to increase the **resoln** limit of the stepper from 0.7  $\mu\text{m}$  to 0.5  $\mu\text{m}$ . During exposure of the top resist, there was light reflection from the alloyed ohmic contacts (source and drain electrodes) into the unexposed region of the T-gate. To avoid this effect a top antireflective coating (TAR) was used. Elec. results on test devices and microwave transistors were presented. S-parameter measurements, up to 75 GHz, were performed on T-gate transistors with the standard HEMT-structure.  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
Section cross-reference(s): 76  
ST transistor gate **lithog** electron beam resist  
IT Transistors  
(gates; **lithog.** process with two-layer resist system in

fabrication of transistor T-gates)  
 IT Resists  
 (electron-beam, **lithog.** process with two-layer resist system  
 in fabrication of transistor T-gates)  
 IT Resists  
 (photo-, **lithog.** process with two-layer resist system in  
 fabrication of transistor T-gates)  
 IT 25086-15-1, Methyl methacrylate-methacrylic acid copolymer  
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)  
 (electron-beam **resist**; **lithog.** process with  
 two-layer **resist** system in fabrication of transistor T-gates)  
 IT 1303-00-0, Gallium arsenide, processes  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PROC (Process); USES (Uses)  
 (**lithog.** process with two-layer resist system in fabrication  
 of transistor T-gates)  
 IT 143549-75-1, Aquatar  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (**lithog.** process with two-layer resist system in fabrication  
 of transistor T-gates)  
 IT 162355-03-5, OCG-LMB 7011  
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)  
 (photoresist; **lithog.** process with two-layer resist system in  
 fabrication of transistor T-gates)  
 IT 25086-15-1, Methyl methacrylate-methacrylic acid copolymer  
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)  
 (electron-beam **resist**; **lithog.** process with  
 two-layer **resist** system in fabrication of transistor T-gates)  
 RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)

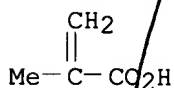
CM 1

CRN 80-62-6  
 CMF C5 H8 O2



CM 2

CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 16 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:76163 HCAPLUS

DN 122:302798

TI Dual-mode behavior of vinyl ether functionalized photoresist

AU Yamaoka, Tsuguo; Kamenosono, Kouji; Moon, Seongyun; Naitoh, Kazuhiko; Kondo, Syun-ichi; Umehara, Akira

CS Department of Image Science, Chiba University, Chiba, 263, Japan

SO Journal of Photopolymer Science and Technology (1994), 7(3), 533-6

CODEN: JSTEEW; ISSN: 0914-9244

DT Journal

LA English

AB A series of dual-mode photoresist (VEC) based on the unique reactions of vinyl ether groups were studied and found to provide high **resoln** with deep-UV exposure. The VEC resist behaves as a dual-mode resist which works as a neg. and a pos. resist depending on the process after the exposure. The reaction mode of vinyl ethers was chosen for this study. Vinyl ether groups with electron rich bonds produce stable carbocations that initiate rapid cationic polymerization. The cationic polymerization of vinyl ethers

offers highly sensitive photopolymers because of their large kinetic chain length and their oxygen sensitivity. Based on these unique reactions of vinyl ether groups, a series of photoresists were synthesized. In 3-component systems, an aqueous base of soluble polymers containing phenolic or carboxyl groups, multifunctional vinyl ether monomers and photoacid generator are the main composition. The 3-component systems offer also the dual mode to work as a neg. or pos. resist depending upon the process condition. The **lithog.** characteristics are variable depending upon the structure of the polymer matrix, functionality of vinyl ether monomer, photoacid generator and on the process condition. Detailed reaction mechanisms and resist characteristics are discussed.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photoresist vinyl ether polymer photoacid generator; **lithog** pos neg dual mode photoresist

IT Phenolic resins; processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(novolak, cresol-based, pos. and neg. dual-mode behavior of vinyl ether functionalized photoresist containing)

IT Resists

(photo-, dual-mode; pos. and neg. dual-mode behavior of vinyl ether functionalized photoresist containing)

IT 137308-86-2, Diphenyliodonium 9,10-dimethoxyanthracene-2-sulfonate

146793-37-5, Diphenyliodonium 8-Anilinonaphthalene-1-sulfonate

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(photoacid generator; pos. and neg. dual-mode behavior of vinyl ether functionalized photoresist containing)

IT 24979-70-2, Poly(4-hydroxystyrene) **25322-25-2**, Acrylic

acid-methyl methacrylate copolymer 26898-31-7, Acrylic acid-butyl

methacrylate-methyl methacrylate co-polymer 150465-76-2

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(pos. and neg. dual-mode behavior of vinyl ether functionalized **photoresist** containing)

IT **25322-25-2**, Acrylic acid-methyl methacrylate copolymer

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

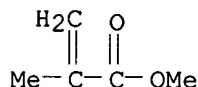
(pos. and neg. dual-mode behavior of vinyl ether functionalized



photoresist containing)  
 RN 25322-25-2 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with 2-propenoic acid  
 (9CI) (CA INDEX NAME)

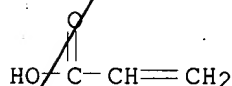
CM 1

CRN 80-62-6  
 CMF C5 H8 O2



CM 2

CRN 79-10-7  
 CMF C3 H4 O2



L59 ANSWER 17 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1994:231694 HCAPLUS  
 DN 120:231694  
 TI Designing high performance krypton monofluoride and argon monofluoride  
 single-layer resists with methacrylate polymers  
 AU Allen, Robert D.; Wallraff, Gregory M.; Hinsberg, William D.; Conley,  
 Willard E.; Kunz, Roderick R.  
 CS Almaden Res. Cent., IBM, San Jose, CA, 95120-6099, USA  
 SO Journal of Photopolymer Science and Technology (1993), 6(4), 575-91  
 CODEN: JSTEEW; ISSN: 0914-9244  
 DT Journal  
 LA English  
 AB The authors discuss two approaches to chemical amplified pos. resists  
 involving the use of a new and versatile class of acid-labile methacrylate  
 polymers. Methacrylate terpolymers originally designed as chemical amplified  
 pos. resists for printed circuit board technol. were found to have  
 excellent optical transmission at 193 nm. These materials serve as the  
 basis for a high **resolution** single layer resist for ArF imaging.  
 In addition, these terpolymers form stable, one-phase mixts. with a variety  
 of phenolic resins and strongly inhibit the dissoln. of phenolics in aqueous  
 base. The new dissoln. inhibitors based on methacrylic acid-tert-Bu  
 methacrylate-Me methacrylate terpolymers have unusual and useful  
 properties, including excellent optical transmission at 248 nm, high glass  
 transition temps., and dissoln. inhibition/promotion power which can be  
 tailored to accommodate the dissoln. properties of a wide variety of  
 phenolic resins.  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)  
 ST methacrylate terpolymer photoresists excimer laser **lithog**  
 IT Phenolic resins, uses

RL: USES (Uses)  
 (novolak, blends with methacrylate terpolymers, as chemical amplified photoresists for excimer laser **lithog.**)

IT Resists  
 (photo-, pos.-working, chemical amplified, single-layer with methacrylate terpolymer, for excimer laser **lithog.**)

IT 29322-78-9, Poly(3-methyl-4-hydroxystyrene)  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. photoresists containing methacrylate terpolymer and , for excimer laser exposures)

IT 66003-78-9, Triphenylsulfonium triflate  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. photoresists containing methacrylate terpolymer and polymethylhydroxystyrene and , for excimer laser exposures)

IT 84563-54-2, Bis(tert-butylphenyl)iodonium triflate  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. photoresists containing methacrylate terpolymer and, for excimer laser exposures)

IT 28549-51-1, tert-Butyl methacrylate-methyl methacrylate copolymer  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. photoresists containing phenolic resin blend with, for excimer laser exposures)

IT 35343-63-6, tert-Butyl methacrylate-methacrylic acid copolymer  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. **photoresists** containing polymethylhydroxystyrene and, for excimer laser exposures)

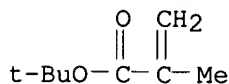
IT 72145-62-1, tert-Butyl methacrylate-methacrylic acid-methyl methacrylate copolymer  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. photoresists containing, for excimer laser exposures)

IT 35343-63-6, tert-Butyl methacrylate-methacrylic acid copolymer  
 RL: USES (Uses)  
 (**lithog.** chemical amplified pos. **photoresists** containing polymethylhydroxystyrene and, for excimer laser exposures)

RN 35343-63-6 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

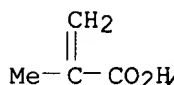
CM 1

CRN 585-07-9  
 CMF C8 H14 O2



CM 2

CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 18 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1994:148672 HCAPLUS

DN 120:148672

TI Two methods of experimental evaluation of long-range proximity function components in electron-beam lithography

AU Bogdanov, Alexei L.; Polyakov, Andrei

CS Dep. Phys., Chalmers Univ. Technol., Goeteborg, S-41296, Swed.

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1993), 11(6), 2758-61

CODEN: JVTBD9; ISSN: 0734-211X

DT Journal

LA English

AB Long range components of a proximity function in electron-beam lithog. are of great importance when high accelerating voltage (V.apprx.50 kV or higher) is used. An addnl. exposure, provided by long-range backscattered electrons, can strongly affect linewidth in a **nanometer** scale lithog. Proximity correction procedures require proximity functions in an anal. or tabular form. The proximity function can be estimated with a certain degree of accuracy using a Monte Carlo simulation of electron scattering in a given set of layers and materials. In the present work, two rather inexpensive and fast methods of exptl. long-range proximity function evaluation are suggested. Comparison of their output and Monte Carlo data produced using standard scattering calcn. algorithms has been made. Results obtained show that these methods can be useful for rapid and almost effortless exptl. proximity function determination First of the reported methods

makes it possible to obtain quant. data on the backscattered exposure that is especially useful for the Monte Carlo algorithms verification.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST proximity effect electron beam lithog

IT Algorithm

(for electron scattering in electron-beam lithog., long-range proximity function components in)

IT Proximity effect

(in electron-beam lithog., exptl. evaluation of)

IT Simulation and Modeling, physicochemical

(Monte Carlo, of electron scattering in electron-beam lithog., long-range proximity function components in)

IT Lithography

(electron-beam, exptl. evaluation of long-range proximity function components in)

IT 9011-14-7, PMMA **25086-15-1** 119574-53-7, SAL-601

RL: USES (Uses)

(electron-beam lithog. using **resist** of, exptl. evaluation of long-range proximity function components in)

IT **25086-15-1**

RL: USES (Uses)

(electron-beam lithog. using **resist** of, exptl. evaluation of long-range proximity function components in)

RN 25086-15-1 HCAPLUS

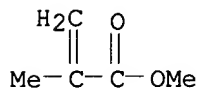
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate

(9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

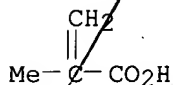
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 19 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1994:148658 HCAPLUS

DN 120:148658

TI Fabrication limits of nanometer T and  $\Gamma$  gates: theory and experiment

AU Maile, B. E.

CS Res. Cent., Daimler Benz AG, Ulm, D-89013, Germany

SO Journal of Vacuum Science &amp; Technology, B: Microelectronics and Nanometer Structures (1993), 11(6), 2502-8

CODEN: JVTBD9; ISSN: 0734-211X

DT Journal

LA English

AB Theor. and exptl. investigations of methods to obtain T- and  $\Gamma$ -shaped sub-100 nm gates using electron-beam lithog., multilayer resist schemes and lift-off are reported. A resist profile simulation tool, based on Monte Carlo electron scattering calcn. and an adaptive string algorithm, is combined with an exptl. determined solubility database for various resist/developer pairs. This provides a very accurate description of the profile formation process for arbitrary resist/substrate stacks and excellent agreement between simulated and exptl. resist profiles is achieved. Limitations due to forward scattering and the influence of development conditions are discussed. Using optimized exposure and development parameters, sub-100 nm T and  $\Gamma$  gates with very low end-to-end resistances can be fabricated without sacrificing process latitudes.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 76

ST electron lithog multilayer resist gate electrode

IT Simulation and Modeling, physicochemical

(Monte Carlo, of electron scattering in electron-beam lithog. resist process, for gate electrodes fabrication)

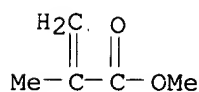
IT Resists

(electron-beam, bilayer, in fabrication of gate electrodes, process limitations in)  
 IT Lithography (electron-beam, fabrication of gate electrodes, process limitations in)  
 IT Transistors (field-effect, gate electrodes in, electron-beam lithog. fabrication of **nanometer** T and  $\Gamma$ , process limitations in)  
 IT 67-63-0, Isopropyl alcohol, uses 108-10-1, Methyl isobutyl ketone  
 RL: USES (Uses)  
 (lithog. development of PMMA resist with solution containing, in electron-beam lithog. fabrication of **nanometer** gate electrodes, process limits in)  
 IT 9011-14-7, PMMA **25086-15-1**, Poly(methacrylic acid-methyl methacrylate)  
 RL: USES (Uses)  
 (lithog. electron-beam bilayer **resist** system containing, in fabrication of gate electrodes, simulated and exptl. study for)  
 IT **25086-15-1**, Poly(methacrylic acid-methyl methacrylate)  
 RL: USES (Uses)  
 (lithog. electron-beam bilayer **resist** system containing, in fabrication of gate electrodes, simulated and exptl. study for)  
 RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

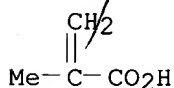
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 20 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1994:19013 HCAPLUS

DN 120:19013

TI An aqueous-base developable photoresist based on light-induced cationic polymerization: resist performance of poly(glycidyl methacrylate-co-methacrylic acid)

AU Naitoh, Kazuhiko; Koseki, Kenichi; Yamaoka, Tsuguo

CS Fac. Eng., Chiba Univ., Chiba, 263, Japan

SO Journal of Applied Polymer Science (1993), 50(2), 243-50

CODEN: JAPNAB; ISSN: 0021-8995

DT Journal

LA English

AB An aqueous-base developable photoresist based on photoinduced cationic polymerization

was prepared by copolymer. of glycidyl methacrylate (GMA) and methacrylic acid (MAA). The copolymer containing 83 mol % of GMA unit is soluble in an aqueous

base and crosslinked in the presence of photogenerated acid caused by acid-initiated ring-opening polymerization of pendant epoxide groups. Exposure results in the generation of acid and the subsequent baking process promotes the diffusion of photogenerated acid, which initiates the cationic crosslinking of the epoxide rings. It was also found that the sensitivity of the copolymer was remarkably enhanced when a divinyl ether monomer is added as a bifunctional crosslinker. The sensitivity enhancement may be caused by the high reactivity of the divinyl ether monomer in the presence of acid. The resist comprised of the copolymer, the vinyl ether monomer, and diphenyliodonium 9,10-dimethoxyanthracene-2-sulfonate as photoacid generator exhibited the sensitivity of 20 mJ/cm<sup>2</sup>. A good pattern profile with high **resolution** was attained by exposure to a 365 nm light followed by a postexposure bake at 60° for 3 min.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photoresist polyglycidyl methacrylate methacrylic acid

IT Resists

(photo-, neg.-working, based on poly(glycidyl methacrylate-methacrylic acid) and acid generator, **lithog.** performance of)

IT 52411-04-8 62613-15-4, Diphenyliodonium hexafluoroarsenate  
121172-98-3, p-Nitrobenzyl-9,10-dimethoxyanthracene-2-sulfonate  
131317-48-1, p-Nitrobenzyl 5-dimethylamino-1-naphthalenesulfonate  
137308-86-2, Diphenyliodonium 9,10-dimethoxyanthracene-2-sulfonate

RL: USES (Uses)

(photoresist containing poly(glycidyl methacrylate-methacrylic acid) and, **lithog.** performance of)

IT 25584-67-2

RL: USES (Uses)

(photoresist performance of)

IT 25584-67-2

RL: USES (Uses)

(photoresist performance of)

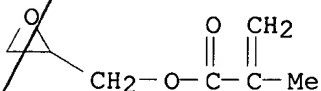
RN 25584-67-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with oxiranylmethyl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

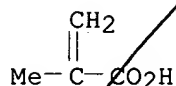
CAN 106-91-2

CMF C7 H10 O3



CM 2

CRN 79-41-4  
CMF C4 H6 O2

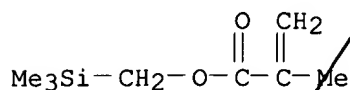


LS9 ANSWER 21 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1993:549495 HCAPLUS  
DN 119:149495  
TI Negative-working photoresist composition  
IN Kobayashi, Yoshihito; Niki, Hiroichi; Oonishi, Kyonobu.  
PA Toshiba Corp., Japan  
SO Jpn. Kokai Tokkyo Koho, 30 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04340550	A2	19921126	JP 1991-112079	19910517
PRAI	JP 1991-112079		19910517		
AB	The title photoresist composition contains an alkali-soluble polymer and R2CR1R3C.tplbond.CC.tplbond.CR4R5R6 [R1-6 = H, aromatic hydrocarbon group, heterocyclyl, or carboarom. or carbocyclic group; R1 and R2 or R4 and R5 may form hydrocarbon or heterocyclic ring]. The composition shows high sensitivity to KrF excimer laser and can be used for high-resoln . patterning.				
IC	ICM G03F007-025 ICS G03F007-004; G03F007-023; G03F007-038; G03F007-075; H01L021-027				
CC	74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)				
ST	photoresist compn neg working lithog				
IT	Semiconductor devices (fabrication of, neg.-working photoresist compns. for)				
IT	Phenolic resins, uses RL: TEM (Technical or engineered material use); USES (Uses) (novolak, photoresist compns. containing)				
IT	Resists (photo-, neg.-working, high-sensitivity)				
IT	3031-68-3, 2,4-Hexadiyne-1,6-diol 23487-69-6 24979-70-2, Poly(p-vinylphenol) 24996-66-5 27029-76-1, m-Cresol-p-cresol- formaldehyde copolymer 32527-15-4 119588-34-0 120551-36-2 135831-10-6 149873-02-9 149873-03-0 149873-04-1 149873-05-2 149873-06-3 149873-07-4 149873-08-5 149873-09-6 149873-10-9 149873-11-0 149873-12-1 149873-13-2 149972-27-0 <b>149972-28-1</b> RL: TEM (Technical or engineered material use); USES (Uses). (photoresist composition containing)				
IT	<b>149972-28-1</b> RL: TEM (Technical or engineered material use); USES (Uses) (photoresist composition containing)				
RN	149972-28-1 HCAPLUS				
CN	2-Propenoic acid, 2-methyl-, (trimethylsilyl)methyl ester, polymer with 2-propenoic acid (9CI) (CA INDEX NAME)				

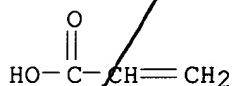
CM 1

CRN 18269-97-1  
CMF C8 H16 O2 Si



CM 2

CRN 79-10-7  
CMF C3 H4 O2



- L59 . ANSWER 22 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1993:135993 HCAPLUS  
DN 118:135993  
TI Submicron modulation-doped field-effect transistor/metal-semiconductor-metal-based optoelectronic integrated circuit receiver fabricated by direct-write electron-beam **lithography**  
AU Ketterson, A.; Tong, M.; Seo, J. W.; Nummila, K.; Cheng, K. Y.; Morikuni, J.; Kang, S.; Adesida, I.  
CS Cent. Compd. Semicond. Microelectron., Univ. Illinois, Urbana, IL, 61801, USA  
SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1992), 10(6), 2936-40  
CODEN: JVTBD9; ISSN: 0734-211X  
DT Journal  
LA English  
AB An all direct-write electron-beam fabrication process was developed for the fabrication of monolithic optoelectronic integrated circuits (OEICs). Various electron-beam resist technologies are studied including image reversed, bilayer, and trilayer systems.. A novel single-step air-bridge formation process using selective development is described. These processes are demonstrated in the fabrication of a 0.85- $\mu\text{m}$  sensitive OEIC receiver comprised of a metal-semiconductor-metal (MSM) detector integrated with a submicron GaAs/InGaAs/AlGaAs pseudomorphic modulation-doped field-effect transistor based transimpedance amplifier. A 3-dB transimpedance bandwidth of 5.6 GHz and a transimpedance bandwidth product of 4.8 THz  $\Omega$  are measured for the amplifier. Discrete high-**resolution** MSM photodetectors with finger/gap spacings of 0.1-1.0  $\mu\text{m}$  were fabricated and characterized.  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
Section cross-reference(s): 76  
ST electron beam **lithog** optoelectronic integrated circuit; submicron modulation doped field effect transistor; metal semiconductor metal optoelectronic integrated circuit; direct write electron beam **lithog** photodetector  
IT **Lithography**



(electron-beam, in fabrication of metal-semiconductor-metal-based optoelectronic integrated circuit receiver)

IT Transistors  
(field-effect, submicron modulation-doped, in optoelectronic integrated circuit receiver, metal-semiconductor-metal-based)

IT Electric circuits  
(optoelectronic, integrated, metal-semiconductor-metal-based, fabricated by direct-write electron-beam lithog.)

IT 9011-14-7, PMMA **25086-15-1** 104137-08-8, AZ5214  
RL: USES (Uses)  
(electron-beam **resist**, optoelectronic integrated circuit receiver fabricated by direct-write electron-beam **lithog.** using)

IT 7440-32-6, Titanium, uses 7440-57-5, Gold, uses  
RL: USES (Uses)  
(fabrication of optoelectronic integrated circuit receiver with grating from)

IT 106389-99-5, Gallium indium arsenide (Ga<sub>0.85</sub>In<sub>0.15</sub>As) 106495-75-4, Aluminum gallium arsenide (Al<sub>0.23</sub>Ga<sub>0.77</sub>As)  
RL: USES (Uses)  
(optoelectronic integrated circuit receiver fabricated on epitaxially grown layer of)

IT 1303-00-0, Gallium arsenide, properties  
RL: PRP (Properties)  
(optoelectronic integrated circuit receiver fabricated on epitaxially grown layer of)

IT 7440-21-3, Silicon, uses  
RL: USES (Uses)  
(optoelectronic integrated circuit receiver fabricated on epitaxially grown layer of aluminum gallium arsenide doped with)

IT 12033-89-5, Silicon nitride, properties  
RL: PRP (Properties)  
(optoelectronic integrated circuit receiver fabrication in relation to)

IT 64-17-5, Ethanol, uses 67-63-0, Isopropyl alcohol, uses 108-10-1, Methyl isobutyl ketone 1330-20-7, Xylene, uses 146479-40-5, AZ 327  
RL: USES (Uses)  
(resist developer, optoelectronic integrated circuit receiver fabricated by direct-write electron-beam **lithog.** using)

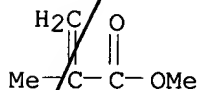
IT **25086-15-1**  
RL: USES (Uses)  
(electron-beam **resist**, optoelectronic integrated circuit receiver fabricated by direct-write electron-beam **lithog.** using)

RN 25086-15-1 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

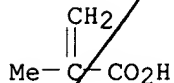
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4/H6 O2



L59 ANSWER 23 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1993:112774 HCAPLUS

DN 118:112774

TI Fabrication of lateral superlattices using multilayer resist techniques

AU Chang, H.; Nummala, K.; Grundbacher, R.; Adesida, I.; Leburton, J. P.; Hess, K.

CS Cent. Compd. Semicond. Microelectron., Univ. Illinois, Urbana, IL, 61801, USA

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1992), 10(6), 2900-3  
CODEN: JVTBD9; ISSN: 0734-211X

DT Journal

LA English

AB A procedure using multilayer resist systems was developed for the fabrication of artificial lateral surface superlattices (LSSLs) and other structures involving multiple point contacts and split gates. Two electron beam exposures are performed with the 1st exposure properly adjusted to result in a development down to the surface of the bottom resist layer with suitable undercut profile in the top resist layers. Electron beam exposure of arbitrary geometries at high **resolution** is then performed on the bottom layer through the opening in the top layers. After metal lift-off, all these geometries are connected together via an air-bridge network. The fabrication of field-effect devices with split gates and LSSL gates in GaAs/AlGaAs modulation-doped heterolayers are demonstrated. These devices exhibit quantum conductance at 1.8 K.CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

Section cross-reference(s): 76

ST lateral superlattice aluminum gallium arsenide heterojunction; multilayer resist electron beam **lithog** superlatticeIT **Lithography**

(electron-beam, fabrication of lateral superlattices using multilayer techniques in)

IT Resists

(electron-beam, multilayer, fabrication of lateral superlattices using)

IT Semiconductor devices

(field-effect, fabrication of, in gallium arsenide/aluminum gallium arsenide modulation-doped heterolayers)

IT Surface structure

(superstructure, lateral, fabrication of, using multilayer resist techniques)

IT 1303-00-0, Gallium arsenide, uses 37382-15-3, Aluminum gallium arsenide ((Al,Ga)As)

RL: USES (Uses)

(fabrication of field-effect devices in heterolayers containing, trilayer resist system for)

IT 9011-14-7, PMMA **25086-15-1**

RL: USES (Uses)  
(trilayer **resist** system containing, for fabrication of  
field-effect devices)

IT 25086-15-1

RL: USES (Uses)  
(trilayer **resist** system containing, for fabrication of  
field-effect devices)

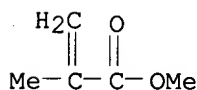
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

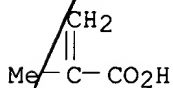
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 24 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1992:601937 HCAPLUS

DN 117:201937

TI photosensitive composition for high **resolution**  
**lithography**

IN Kobayashi, Yoshihito; Niki, Hiroichi; Onishi, Kiyonobu

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 36 pp.

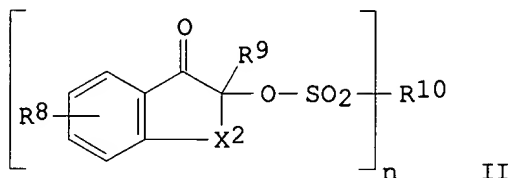
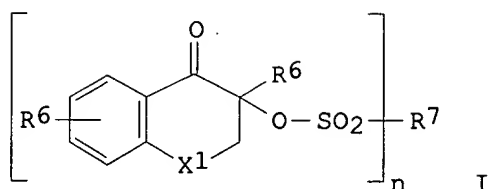
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03289659	A2	19911219	JP 1990-285776	19901025
PRAI	JP 1990-76601	A1	19900328		
GI					



AB The title photosensitive composition comprises an alkali soluble polymer, an organic

dissoln. suppressing agent containing a substituent decomposable by an acid, and a photoacid generator selected from [R1C(O)CR2R3OSO2]nR4, I, II, and [R11C(O)CR12R13CR14HOSO]nR4 [R1-3, R5,6, R8,9, R11-14 = H, halo, CN, silyl, monovalent organic group; R4, R7, R10, R15 = organic group; n = 1-7;

X1,2

= O, S, CO, SO2, CR1R2, NCOR3].

IC ICM G03F007-075

ICS G03F007-004; G03F007-039; H01L021-027

CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photolithog photosensitive compn photoresist

IT Siloxanes and Silicones, uses

RL: TEM (Technical or engineered material use); USES (Uses) (photoresist composition containing)

IT Resists

(photo-, composition, for high **resolution** patterning)

IT **Lithography**

(photo-, photoresist compn for)

IT	117458-06-7	138888-97-8	139054-53-8	142952-62-3	143897-55-6
	143897-56-7	143897-57-8	143897-58-9	143897-59-0	143897-60-3
	143897-61-4	143897-62-5	143897-63-6	143897-64-7	143897-65-8
	143897-66-9	143897-67-0	143897-68-1	143987-46-6	143987-47-7

RL: USES (Uses)

(dissoln. suppressing agent, photoresist composition containing)

IT	4298-69-5	9010-92-8	19255-01-7	24979-70-2, Poly(p-vinylphenol)	
	25053-88-7, p-Cresol-formaldehyde copolymer	25085-34-1	25086-36-6, m-Cresol-formaldehyde copolymer	41996-76-3	51256-40-7 82540-07-6
	87456-51-7	87456-53-9	87456-54-0	87456-61-9	<b>102868-49-5</b>

	119588-34-0	143897-22-7	143897-23-8	143897-24-9	143897-25-0
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	143897-26-1	143897-27-2	143897-28-3	143897-29-4	143897-30-7
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	143897-31-8	143897-32-9	143897-33-0	143897-34-1	143897-35-2
--	-------------	-------------	-------------	-------------	-------------

	143897-36-3	143897-37-4	143897-38-5	143897-39-6	143897-40-9
--	-------------	-------------	-------------	-------------	-------------

	143897-41-0	143897-42-1	143897-43-2	143897-44-3	143897-45-4
--	-------------	-------------	-------------	-------------	-------------

	143897-46-5	143897-47-6	143897-48-7	143897-49-8	143897-50-1
--	-------------	-------------	-------------	-------------	-------------

	143897-51-2	143897-52-3	143897-53-4	143897-54-5	143908-37-6
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**143987-45-5** 144025-37-6

RL: TEM (Technical or engineered material use); USES (Uses)

(photoresist composition containing)

IT **102868-49-5 143987-45-5**

RL: TEM (Technical or engineered material use); USES (Uses)  
(photoresist composition containing)

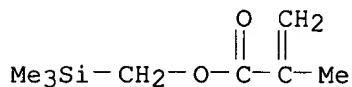
RN 102868-49-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with (trimethylsilyl)methyl  
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 18269-97-1

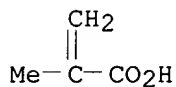
CMF C8 H16 O2 Si



CM 2

CRN 79-41-4

CMF C4 H6 O2



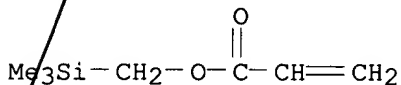
RN 143987-45-5 HCAPLUS

CN 2-Propenoic acid, polymer with (trimethylsilyl)methyl 2-propenoate (9CI)  
(CA INDEX NAME)

CM 1

CRN 67186-35-0

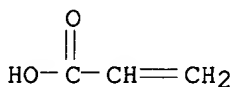
CMF C7 H14 O2 Si



CM 2

CRN 79-10-7

CMF C3 H4 O2



DN 117:36362

TI New thermally crosslinkable electron beam resists. 2. Monomethyl itaconate-methyl methacrylate copolymers

AU Miles, A. F.; Cowie, J. M. G.; Bennett, R. H.; Brambley, D. R.

CS Dep. Chem., Heriot-Watt Univ., Edinburgh, EH14 4AS, UK

SO Polymer (1992), 33(9), 1932-6

CODEN: POLMAG; ISSN: 0032-3861

DT Journal

LA English

AB The **lithog.** evaluation of monomethyl itaconate (MMI) and Me methacrylate copolymers as thermally crosslinkable electron beam resists is described. Their properties were investigated as a function of copolymer composition and primary molar mass to determine an optimum formulation for

the preparation of high **resolution** resist patterns. Line and space test patterns with features <0.5  $\mu\text{m}$  were prepared using copolymers containing 10 mol% MMI with **lithog.** sensitivity of .apprx.80  $\mu\text{C-cm}^{-2}$  and resist contrast of .apprx.4  $\text{cm}^2\text{-}\mu\text{C}^{-1}$  when developed in a mixture of n-Bu acetate and n-hexyl acetate. In accordance with previously published results, the electron exposure dose required to first destroy the pre-crosslinked fraction of the resist was very much less than the electron exposure dose required for the preparation of high **resolution** resist patterns. The obtained results are compared to a theory of gel degradation originally developed to describe the solubilization of lignin from plant tissue, whereby the breakdown of the gel can be modeled using the statistics for random network formation, except applied in reverse.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST thermal crosslink electron beam resist **lithog**; methyl itaconate methyl methacrylate copolymer resist

IT Resists  
(electron-beam, thermally crosslinkable, monomethyl itaconate-Me methacrylate copolymers as)

IT 37871-58-2, Monomethyl itaconate-methyl methacrylate copolymer

RL: USES (Uses)

(**lithog.** thermally crosslinkable electron beam **resists** from)

IT 37871-58-2, Monomethyl itaconate-methyl methacrylate copolymer

RL: USES (Uses)

(**lithog.** thermally crosslinkable electron beam **resists** from)

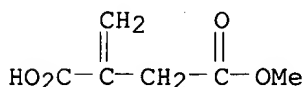
RN 37871-58-2 HCAPLUS

CN Butanedioic acid, methylene-, 4-methyl ester, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

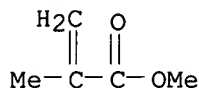
CRN 7338-27-4

CMF C6 H8 O4



CM 2

CRN 80-62-6  
CMF C5 H8 O2



L59 ANSWER 26 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1992:95477 HCAPLUS

DN 116:95477

TI A positive, chemically amplified, aromatic methacrylate resist employing the tetrahydropyranyl protecting group

AU Taylor, Gary N.; Stillwagon, Larry E.; Houlihan, Francis M.; Wolf, Thomas M.; Sogah, Dotsevi Y.; Hertler, Walter R.

CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1991), 9(6), 3348-56  
CODEN: JVTBD9; ISSN: 0734-211X

DT Journal

LA English

AB The synthesis, properties, and lithog. behavior are described of a new class of chemical-amplified, pos.-tone, aromatic methacrylate resists incorporating the tetrahydropyranyl protecting group bound to base-solubilizing carboxylic acid moieties. Copolymers containing equimolar amts. of benzyl methacrylate and tetrahydropyranyl methacrylate were prepared by free radical and group transfer polymerization (GTP).

Photogenerated

sulfonic acids formed from covalent ester or ionic salt precursors were used to remove the acid labile tetrahydropyranyl (THP) group by heating after exposure. The resulting copolymers of benzyl methacrylate (BMA) and methacrylic acid (MAA) are extremely soluble in aqueous base solns. when the

MAA

concentration exceeds 38 mol%, thus affording pos. tone patterns. These copolymer resists have high sensitivity (<30 mJ/cm<sup>2</sup>) when formulated with aromatic sulfonate or trifluoromethyl sulfonate sensitizers. Contrast is >2 and submicrometer patterns in 1 μm thick films are **resolved**.

**Resolution** is significantly influenced by the sensitizer, post exposure heating and development conditions. Mol. weight distribution have little effect on the lithog. properties. **Resolution** presently is limited by resist adhesion which remains to be optimized. Plasma etching resistance to conditions used to etch Al is 1:8 times less than for hard-baked HPR-206 photoresist, but can be improved to a value of 1.5 by postexposure thermolysis. Improvements are needed before this type of chemical-amplified resist is able to meet all deep-UV lithog. requirements. However, it appears quite promising for other lower **resolution** (>1 μm), thick-film-imaging applications.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST chem amplified arom methacrylate resist; photoresist arom methacrylate deep UV lithog; photolithog deep UV resist tetrahydropyranyl protection

IT Resists

(photo-, pos.-working, chemical amplified, aromatic methacrylates as, with tetrahydropyranyl protecting group)

IT 75-75-2, Methane sulfonic acid 85-47-2, 1-Naphthalene sulfonic acid

98-11-3, Benzene sulfonic acid, properties 104-15-4, p-Toluene sulfonic

acid, properties 110-16-7, Maleic acid, properties 120-18-3,  
2-Naphthalene sulfonic acid 144-62-7, Oxalic acid, properties  
1493-13-6, Trifluoromethanesulfonic acid

RL: USES (Uses)

(design and selection of photoacid generator for photoresist  
formulation using model compound of)

IT 6293-66-9, Diphenyliodonium tosylate 66003-76-7 66003-78-9  
114719-51-6 123658-14-0 136750-69-1

RL: USES (Uses)

(photoacid generator, **lithog.** performance of poly(benzyl  
methacrylate-tetrahydropyranyloxy methacrylate) affected by)

IT 75-59-2, Tetramethylammonium hydroxide

RL: USES (Uses)

(photoresist developer solution containing, development and **lithog.**  
performance of pos. chemical amplified resist in)

IT 110-91-8, Morpholine, uses

RL: USES (Uses)

(photoresist developer solution containing, development of pos. chemical  
amplified aromatic methacrylate resist in)

IT 65697-21-4, Poly(benzyl methacrylate-methacrylic acid)

119359-85-2, Poly(benzyl methacrylate-tetrahydropyranyl methacrylate)

RL: USES (Uses)

(**photoresist** from, deep-UV **lithog.** performance of)

IT 84420-14-4, HPR 206

RL: RCT (Reactant); RACT (Reactant or reagent)

(plasma etching of, for comparison with pos. chemical amplified aromatic  
methacrylate resist)

IT 25085-83-0, Poly(benzylmethacrylate)

RL: RCT (Reactant); RACT (Reactant or reagent)

(plasma etching of, in comparison with copolymer containing  
tetrahydropyranyl methacrylate and)

IT 65697-21-4, Poly(benzyl methacrylate-methacrylic acid)

RL: USES (Uses)

(**photoresist** from, deep-UV **lithog.** performance of)

RN 65697-21-4 HCAPLUS

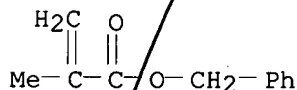
CN 2-Propenoic acid, 2-methyl-, polymer with phenylmethyl

2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 2495-37-6

CMF C11 H12 O2

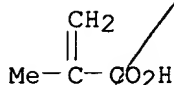


CM 2

CRN 79-41-4

CMF C4 H6 O2





L59 ANSWER 27 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1991:643752 HCAPLUS

DN 115:243752

TI Positive, chemically-amplified aromatic methacrylate resist employing the tetrahydropyranyl protecting group

AU Taylor, Gary N.; Stillwagon, Larry E.; Houlihan, Francis M.; Wolf, Thomas M.; Sogah, Dotsevi Y.; Hertler, Walter R.

CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA

SO Chemistry of Materials (1991), 3(6), 1031-40

CODEN: CMATEX; ISSN: 0897-4756

DT Journal

LA English

AB The synthesis, properties and lithog. behavior of a new class of chemical amplified, pos.-tone, aromatic methacrylate resists incorporating the tetrahydropyranyl protecting group bound to base-solubilizing carboxylic acid moieties are described. Copolymers containing equimolar amts. of benzyl methacrylate and tetrahydropyranyl methacrylate were prepared by free-radical and group-transfer polymerization (GTP). Photogenerated sulfonic acids formed from covalent ester or ionic salt precursors were used to remove the acid-labile tetrahydropyranyl (THP) group by heating after exposure. The resulting copolymers of benzyl methacrylate (BMA) and methacrylic acid (MAA) are extremely soluble in aqueous base solns. when the

MAA concentration exceeds 38 mol %, thus affording pos. tone patterns. This class of

resins has low absorbance at 248 nm needed for patterning  $\geq 1\text{-}\mu\text{m}$ -thick films. The moderate THP group concentration and its relatively small size minimize shrinkage during thermal and plasma processing. The nearly monodisperse polymers formed by GTP offer the advantages of better mol. weight control and the opportunity to study the effect of mol. weight distribution on this class of resists. These copolymer resists have high sensitivity ( $< 30\text{ mJ/cm}^2$ ) when formulated with aromatic sulfonate or trifluoromethyl sulfonate sensitizers. Contrast is  $> 2$  and submicrometer patterns in  $1\text{-}\mu\text{m}$ -thick films are **resolved**.

**Resolution** is significantly influenced by the sensitizer, postexposure heating, and development conditions. **Resolution** presently is limited by resist adhesion which remains to be optimized. Plasma etching resistance to conditions used to etch Al is 1.8 times less than for hard-baked HPR-206 photoresist but can be improved to a value of 1.5 by postexposure thermolysis. Improvements are needed before this type of chemical amplified resist is able to meet all deep-UV lithog. requirements.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST benzyl hydropyranyl methacrylate polymer resist submicron; chem amplified photoresist polymer submicron

IT Resists  
(photo-, polymeric, benzyl methacrylate-tetrahydropyranyl methacrylate polymer for chemical amplified)

IT 114719-51-6, 2,6-Dinitrobenzyl tosylate 123658-14-0

RL: USES (Uses)

(chemical amplified resist system containing aromatic methacrylate copolymer and)

IT 57835-99-1 57900-42-2  
 RL: USES (Uses)  
 (chemical amplified resist system containing benzyl methacrylate-tetrahydropyranyl methacrylate polymer and)

IT 75-59-2, Tetramethylammonium hydroxide 110-91-8, Morpholine, uses and miscellaneous  
 RL: USES (Uses)  
 (developer, in processing of chemical amplified aromatic methacrylate polymeric resist)

IT 65697-21-4P, Benzyl methacrylate-methacrylic acid polymer  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in processed chemical amplified benzyl methacrylate-tetrahydropyranyl methacrylate polymer **resist** system)

IT 1493-13-6, Triflic acid  
 RL: USES (Uses)  
 (in testing of benzyl methacrylate-tetrahydropyranyl methacrylate copolymer resist system)

IT 119359-85-2P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and use of, in chemical amplified resist systems)

IT 52858-59-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and use of, in formation of copolymer for chemical amplified resist system)

IT 136750-63-5P 136750-69-1P  
 RL: PREP (Preparation)  
 (preparation of, for chemical amplified resist system containing aromatic methacrylate copolymer)

IT 136750-62-4P  
 RL: PREP (Preparation)  
 (preparation of, for chemical amplified resist system study)

IT 106342-09-0P 136750-61-3P 136750-68-0P  
 RL: PREP (Preparation)  
 (preparation of, for formation of copolymer for chemical amplified resist system)

IT 51012-12-5 85248-36-8  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, in preparation of copolymer for chemical amplified resist system)

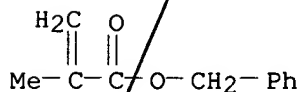
IT 65697-21-4P, Benzyl methacrylate-methacrylic acid polymer  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in processed chemical amplified benzyl methacrylate-tetrahydropyranyl methacrylate polymer **resist** system)

RN 65697-21-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with phenylmethyl  
 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

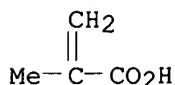
CRN 2495-37-6  
 CMF C11 H12 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 28 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1991:594018 HCAPLUS

DN 115:194018

TI Fine undercut control in bilayer poly(methyl methacrylate)-poly(methyl methacrylate-methacrylic acid) resist system for E-beam lithography with submicrometer resolution

AU Bogdanov, A. L.; Andersson, Eva Karin

CS Dep. Phys., Chalmers Univ. Technol., Goeteborg, S-412, Swed.

SO Proceedings of SPIE-The International Society for Optical Engineering (1991), 1465(Electron-Beam, X-Ray, Ion-Beam Submicrometer Lithogr. Manuf.), 324-9

CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

AB An exposure scheme is proposed which makes it possible to control the amount of sidewall development of the copolymer layer in the title PMMA-P(MMA-MAA) E-beam resist system for the submicrometer lift-off process. Control was provided by dose variation. The monitor pattern for on line testing of lift-off resist systems during development was designed and proved to be practicable. Using the methods patterns <70 nm were fabricated by the lift-off process.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST submicron bilayer methacrylate polymer electron resist

IT Resists

(electron-beam, bilayer PMMA-poly(Me methacrylate-methacrylic acid), with fine undercut control for submicron lithog.)

IT 9011-14-7, PMMA 25086-15-1, Methacrylic acid-methylmethacrylate polymer

RL: USES (Uses)

(in bilayer electron beam resist system for submicron lithog., with fine undercut control)

IT 25086-15-1, Methacrylic acid-methylmethacrylate polymer

RL: USES (Uses)

(in bilayer electron beam resist system for submicron lithog., with fine undercut control)

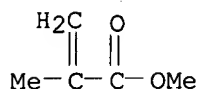
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

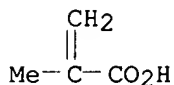
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2

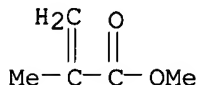


L59 ANSWER 29 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1991:174810 HCAPLUS  
DN 114:174810  
TI **Nanosecond** exposure processes of x-ray resists  
AU Kukharensko, Yu. A.; Leonov, Yu. S.  
CS USSR  
SO Mikroelektronika (1990), 19(6), 555-63  
CODEN: MKETA9; ISSN: 0544-1269  
DT Journal  
LA Russian  
AB Masks from Au or Si-polyimide membranes were used with a plasma x-ray source to expose resists for periods of **nanoseconds**. The plasma source gives high resolution A model is given for x-ray absorption by Me resists.  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
ST x ray resist exposure model; silicon polyimide membrane gold mask exposure  
IT Polyamides, uses and miscellaneous  
RL: USES (Uses)  
(**nanosecond** exposure processes of x-ray resists using mask with layer of)  
IT Resists  
(x-ray, poly(Me methacrylate-methacrylic acid), **nanosecond** exposure processes of)  
IT **25086-15-1**, Methacrylic acid-methyl methacrylate polymer  
RL: USES (Uses)  
(**nanosecond** exposure processes of x-ray **resists** of)  
IT 7440-21-3, Silicon, properties  
RL: PRP (Properties)  
(**nanosecond** exposure processes of x-ray resists using mask with layer of)  
IT 7440-57-5, Gold, properties  
RL: PRP (Properties)  
(**nanosecond** exposure processes of x-ray resists using mask with pattern of)  
IT **25086-15-1**, Methacrylic acid-methyl methacrylate polymer  
RL: USES (Uses)  
(**nanosecond** exposure processes of x-ray **resists** of)  
RN 25086-15-1 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

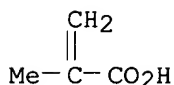
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2

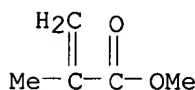


L59 ANSWER 30 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1990:641300 HCAPLUS  
DN 113:241300  
TI Resist materials based on methacrylic acid methyl ester-methacrylic acid copolymers for use in high-**resolution lithography**  
AU Pfeiffer, K.; Kudryashov, V. A.; Lorkowski, H. J.  
CS Zentralinst. Org. Chem., Akad. Wiss. DDR, Berlin, DDR-1199, Ger. Dem. Rep.  
SO Journal of Information Recording Materials (1990), 18(3), 211-17  
CODEN: JIRMEA; ISSN: 0863-0453  
DT Journal  
LA German  
AB The structural modification of copolymers from Me methacrylate and methacrylic acid by thermal treatment in the temperature range of 140-200° leads to a change of the radiation sensitivity and solubility. This dependence can be used to produce vertical, undercut structure profiles in electron beam and x-ray **lithog.**  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)  
ST resist methyl methacrylate methacrylic acid polymer; electron resist methacrylate polymer; x ray resist methacrylate polymer  
IT Resists  
(electron-beam, polymers from Me methacrylate and methacrylic acid, thermal treatment for improved sensitivity and solubility of)  
IT Resists  
(x-ray, polymers from Me methacrylate and methacrylic acid, thermal treatment for improved sensitivity and solubility of)  
IT **25086-15-1**, Methacrylic acid-methyl methacrylate polymer  
RL: USES (Uses)  
(electron-beam and x-ray **resists** from, thermally treated for improved sensitivity and solubility)  
IT **25086-15-1**, Methacrylic acid-methyl methacrylate polymer  
RL: USES (Uses)  
(electron-beam and x-ray **resists** from, thermally treated for improved sensitivity and solubility)

RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)

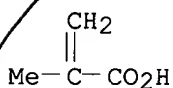
CM 1

CRN 80-62-6  
 CMF C5 H8 O2



CM 2

CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 31 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1990:488088 HCAPLUS

DN 113:88088

TI Multilayer resists with variable layer parameters for submicron  
**lithography**

AU Aristov, V. V.; Dmitriyeva, V. A.; Kudryashov, V. A.; Pfeiffer, K.;  
 Lorkowski, H. J.

CS Inst. Microelectron. Technol. High Purity Mater., Chernogolovka, 142432,  
 USSR

SO Microelectronic Engineering (1990), 11(1-4), 553-6  
 CODEN: MIENEF; ISSN: 0167-9317

DT Journal

LA English

AB The properties of Me acrylate-methacrylic acid copolymer used as a resist  
 in submicron **lithog.** were investigated. Besides high  
 sensitivity, contrast, and **resolution**, the resist exhibits  
 nonmonotonic dependence of sensitivity on the prebake temperature This allows  
 fabrication of multilayer resist films with different ratios of layer  
 sensitivity and so permits control of resist structure profiles.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)

ST submicron **lithog** multilayer resist x ray; methyl acrylate  
 methacrylic acid polymer resist

IT Resists  
 (x-ray, polymeric, multilayer, for submicron **lithog.**)

IT 128715-93-5 128715-94-6

RL: USES (Uses)

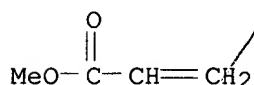
(developer, for multilayer resist system for submicron **lithog**  
 .)

IT 26589-39-9

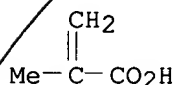
RL: USES (Uses)

(lithog. multilayer resist containing)  
 IT 26589-39-9  
 RL: USES (Uses)  
 (lithog. multilayer resist containing)  
 RN 26589-39-9 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1  
 CRN 96-33-3  
 CMF C4 H6 O2



CM 2  
 CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 32 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1990:88314 HCAPLUS  
 DN 112:88314  
 TI Method for preparing contrast-enhancing layer for photoresist  
 IN Fanghaenel, Egon; Bauroth, Jan Uwe; Bauer, Joachim  
 PA Technische Hochschule "Carl Schorlemmer" Leuna-Merseburg, Ger. Dem. Rep.  
 SO Ger. (East), 4 pp.  
 CODEN: GEXXA8  
 DT Patent  
 LA German  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 265008	A1	19890215	DD 1987-309315	19871123
PRAI	DD 1987-309315		19871123		

OS MARPAT 112:88314

AB Contrast-enhancing layers for use in improving the **resolution** and contrast of microstructures in the photolithog. production of microelectronic elements contain a trans-1H-aryl-3-heterocyclidinetriazenium salt. Thus, a semiconductor disk was coated with a photoresist layer (conventional novolak photoresist), a poly(vinyl alc.) interlayer, and a contrast-enhancing layer from 1-(p-tolyl)-3-[3-butylbenzthiazolinyldene-(2)]triazene, p-toluenesulfonic acid, amonically polymerized  $\alpha$ -methylstyrene, and tetrachloroethane. After exposure the contrast enhancing layer was removed with tetrachloroethane, and the photoresist layer was developed with an aqueous solution to give a resist structure with improved **resolution**

IC ICM G03F007-26  
ICS G03F007-08

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photoresist contrast enhancing layer; photolithog contrast enhancing layer; arylheterocyclidenetriazenium salt photoresist contrast enhancement

IT Phenolic resins, uses and miscellaneous  
Polyesters, uses and miscellaneous  
RL: USES (Uses)  
(photoresist contrast-enhancing layers containing trans-arylheterocyclidenetriazinium salt and)

IT Electronics  
(micro-, devices, contrast-enhancing layer for photolithog. production of)

IT Resists  
(photo-, contrast-enhancing layers containing trans-arylheterocyclidenetriazinium salt for)

IT **Lithography**  
(photo-, contrast-enhancing layers for use in)

IT Siloxanes and Silicones, uses and miscellaneous  
RL: USES (Uses)  
(polyester-, aromatic, photoresist contrast-enhancing layers containing trans-arylheterocyclidenetriazinium salt and)

IT Polyesters, uses and miscellaneous  
RL: USES (Uses)  
(siloxane-, aromatic, photoresist contrast-enhancing layers containing trans-arylheterocyclidenetriazinium salt and)

IT 123772-33-8 123772-34-9  
RL: USES (Uses)  
(photoresist contrast-enhancing layer containing)

IT 97-05-2 104-15-4, p-Toluenesulfonic acid; properties 9003-39-8, Poly(vinylpyrrolidone) 25014-31-7, Poly( $\alpha$ -methylstyrene)  
RL: USES (Uses)  
(photoresist contrast-enhancing layer containing (tolyl)(butylbenzthiazolinyldene)triazine and)

IT 9002-86-2, Poly(vinyl chloride) 9002-89-5, Poly(vinyl alcohol) 9003-20-7, Poly(vinyl acetate) 9003-53-6, Polystyrene 9003-55-8, Butadiene-styrene copolymer 9004-34-6D, Cellulose, derivs. 9011-16-9 25119-62-4, Allyl alcohol-styrene copolymer **25302-81-2**, Acrylic acid-methyl acrylate copolymer  
RL: USES (Uses)  
(**photoresist** contrast-enhancing layers containing trans-arylheterocyclidenetriazinium salt and)

IT **25302-81-2**, Acrylic acid-methyl acrylate copolymer  
RL: USES (Uses)  
(**photoresist** contrast-enhancing layers containing trans-arylheterocyclidenetriazinium salt and)

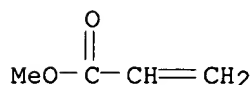
RN 25302-81-2 HCAPLUS

CN 2-Propenoic acid, polymer with methyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 96-33-3

CMF C4 H6 O2

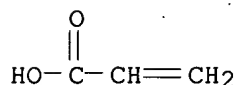




CM 2

CRN 79-10-7

CMF C3 H4 O2



L59 ANSWER 33 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1989:644366 HCAPLUS

DN 111:244366

TI Photopolymerizable compositions for high-resolution  
**lithographic** plates

IN Kita, Nobuyuki; Koike, Mitsuru

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01013141	A2	19890118	JP 1987-168191	19870706
PRAI	JP 1987-168191		19870706		

AB The title compns. sensitive to Ar laser contain photopolymerizable monomer containing  $\geq 1$  ethylenic unsatn. and photopolymn. initiator comprising cationic organic dye compound organoboron compound anion salts and aromatic onium or

halonium salts.

IC ICM G03C001-68

ICS C08F002-50

ICA G03C005-16

CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)ST cationic dye borate photosensitizer; halonium dye borate photosensitizer;  
photopolymerizable **lithog** plateIT **Lithographic** plates

(photoresists, photosensitizers for)

IT Resists

(photo-, acrylic, photosensitizers for)

IT Polymerization catalysts

(photochem., cationic dye organoborate and onium compds. and halonium  
compds., for **lithog.** plates)IT 24806-57-3 58109-40-3 117522-03-9 120307-08-6 123051-21-8  
124086-15-3

RL: CAT (Catalyst use); USES (Uses)

(photopolymn. catalysts containing, for acrylic **lithog.** plates)IT **90216-38-9**, Allyl methacrylate-methacrylic acid copolymer

110220-20-7

RL: USES (Uses)

(photoresists containing, for **lithog.** plates,  
photosensitizers for)IT **90216-38-9**, Allyl methacrylate-methacrylic acid copolymer

RL: USES (Uses)

(photoresists containing, for lithog. plates,  
photosensitizers for)

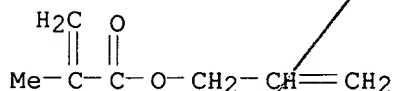
RN 90216-38-9 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with 2-propenyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)

CM 1

CRN 96-05-9

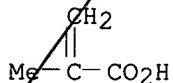
CMF C7 H10 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 34 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1989:240225 HCAPLUS

DN 110:240225

TI UV-sensitive, positive-working copying composition containing  
diazobarbituric acid derivative

IN Thurner, Joern Uwe; Ulbricht, Mathias; Brosche, Karola; Schirmer,  
Matthias; Tomaschewski, Georg

PA Humboldt-Universitaet zu Berlin, Ger. Dem. Rep.

SO Ger. (East), 11 pp.

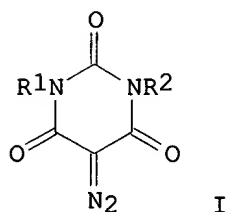
CODEN: GEXXA8

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 261857	A1	19881109	DD 1985-280531	19850912
PRAI	DD 1985-280531		19850912		
OS	MARPAT 110:240225				
GI					



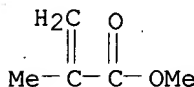
- AB UV-sensitive, pos.-working copying compns. for **lithog.** and microlithog. applications, which give a high **resolution**, contain a binder with a suitable absorption window and/or improved UV transmittance in the mixture with the radiation-sensitive components, that absorb in the 200-320 nm region. The compns. consist of a mixture of a copolymer of an unsatd. carboxylic acid and its derivs. and/or a PhOH-HCHO resin and a 5-diazobarbituric acid (I; R1,R2 = H, alkyl, cycloalkyl, aryl, or substituted aryl) or a mixture of various I. A Si wafer was coated with a solution containing a PhOH-HCHO resin, 5-diazobarbituric acid, Et cellosolve, BuOAc, DMSO, and xylene to give a thin film, dried, imagewise exposed to a suitable original, and developed with aqueous NaOH give pos. relief with good image reproduction
- IC ICM G03C001-52
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic Processes**)  
Section cross-reference(s): 28
- ST pos photoresist diazobarbituric acid deriv
- IT Phenolic resins, uses and miscellaneous  
RL: USES (Uses)  
(pos.-working photoresists containing diazobarbituric acid derivs. and, for high-**resolution** images)
- IT Resists  
(photo-, pos.-working, containing diazobarbituric acid derivs., for high-**resolution** images)
- IT 9003-35-4, Phenol-formaldehyde copolymer **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer  
RL: USES (Uses)  
(pos.-working **photoresists** containing diazobarbituric acid derivs. and, for high-**resolution** images)
- IT 31221-06-4, 5-Diazobarbituric acid 74808-90-5  
RL: USES (Uses)  
(pos.-working photoresists containing, for high-**resolution** images)
- IT 116418-82-7P 117135-75-8P  
RL: PREP (Preparation)  
(preparation and pos.-working photoresists containing, for high-**resoln** . images)
- IT 35824-91-0P, 1,3-Dicyclohexylbarbituric acid  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and reaction of, with azidoethylbenzothiazolium tetrafluoroborate)
- IT 7391-60-8, 1,3-Diphenylbarbituric acid  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with azidoethylbenzothiazolium tetrafluoroborate)
- IT 722-75-8, 2-Azido-3-ethylbenzothiazolium tetrafluoroborate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with barbituric acid derivs.)

IT 141-82-2, Malonic acid, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with dicyclohexylurea)  
 IT 2387-23-7, N,N'-Dicyclohexylurea  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with malonic acid)  
 IT 25086-15-1, Methacrylic acid-methyl methacrylate copolymer  
 RL: USES (Uses)  
 (pos.-working **photoresists** containing diazobarbituric acid  
 derivs. and, for high-**resolution** images)  
 RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

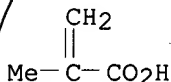
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 35 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1988:580229 HCAPLUS  
 DN 109:180229  
 TI High **resolution** trilayer electron beam resist system employing  
 methyl methacrylate - methacrylic acid polymer and reliable reactive ion  
 etch processes  
 AU Mele, Thomas C.; Perera, Asanga H.; Krusius, J. Peter  
 CS Sch. Electr. Eng., Cornell Univ., Ithaca, NY, 14853, USA  
 SO Proceedings of SPIE-The International Society for Optical Engineering  
 (1988), 923(Electron-Beam, X-Ray, Ion-Beam Technol.: Submicrometer  
 Lithogr. 7), 217-23  
 CODEN: PSISDG; ISSN: 0277-786X  
 DT Journal  
 LA English  
 AB A high **resolution** trilayer resist system based on the copolymer  
 e-beam resist poly(methyl methacrylate-methacrylic acid), SiO2 interlayer,  
 and a polyimide base layer is described. High **resolution** reactive  
 ion etch processes are developed that minimize base layer undercut and  
 provide for cleanly patterned windows for 150 nm thick Al lift-off.  
 Residue formation on the base layer sidewalls after reactive ion etching  
 depends on the substrate film composition Linewidth variations as a function

of exposure dose, development time, and reactive ion etch conditions are discussed. The extent to which trilayer stencils can be used for high **resolution** reversal processes is limited by the polyimide thickness required for planarization and proximity effect reduction, Al film thickness required, and the min. line space desired.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST electron resist trilayer polymer **lithog**; methacrylic acid methyl methacrylate polymer resist

IT Polyimides, uses and miscellaneous  
RL: USES (Uses)  
(**lithog**. trilayer resist system containing)

IT Resists  
(electron-beam, trilayer, containing methacrylic acid-Me methacrylate polymer and polyimide layers and silicon dioxide interlayer)

IT 117148-76-2, QZ 3289 117148-77-3, QZ 3290  
RL: USES (Uses)  
(adhesion promoter, for polyimides in trilayer electron beam resist system)

IT 7440-21-3, Silicon, uses and miscellaneous  
RL: USES (Uses)  
(**lithog**. imaging of, using trilayer electron beam resist system)

IT 7631-86-9, Silicon dioxide, uses and miscellaneous  
RL: USES (Uses)  
(**lithog**. imaging using trilayer electron beam resist system with interlayer of)

IT **25086-15-1**, Methacrylic acid-methyl methacrylate polymer  
RL: USES (Uses)  
(**lithog**. trilayer electron beam **resist** system containing layer of, with reliable reactive ion etch processes)

IT 101506-28-9, XU285 106442-39-1, XU284  
RL: USES (Uses)  
(trilayer electron beam resist system containing layer of)

IT 7429-90-5, Aluminum, properties  
RL: PRP (Properties)  
(trilayer electron beam resist system for lift-off of film of)

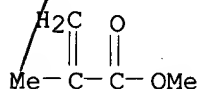
IT **25086-15-1**, Methacrylic acid-methyl methacrylate polymer  
RL: USES (Uses)  
(**lithog**. trilayer electron beam **resist** system containing layer of, with reliable reactive ion etch processes)

RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

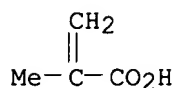
CM 1

CRN 80-62-6  
CMF C5 H8 O2



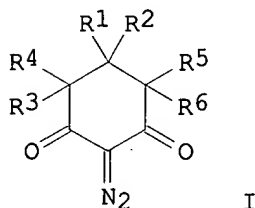
CM 2

CRN 79-41-4  
CMF C4 H6 O2



L59 ANSWER 36 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1988:177232 HCAPLUS  
DN 108:177232  
TI UV-sensitive positive-working copying composition II  
IN Thurner, Joern Uwe; Hinzmann, Bernd; Tomaschewski, Georg; Schirmer, Matthias  
PA Humboldt-Universitaet zu Berlin, Ger. Dem. Rep.  
SO Ger. (East), 4 pp.  
CODEN: GEXXA8  
DT Patent  
LA German  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 247759	A1	19870715	DD 1983-253234	19830720
PRAI	DD 1983-253234		19830720		
GI					



AB UV-sensitive, pos.-working copying compns. for lithog. and microlithog. that give high-resolution images are composed of a binder having an absorption window to provide improved UV transparency and a 6-membered alicyclic 2-diazo-1,3-diketone of the formula I (R1 = H, alkyl, aryl, or substituted aryl; R2 = H or alkyl; R3 = H, alkyl, aryl, substituted aryl, CN, or alkoxy carbonyl; R4 = H or alkoxy carbonyl; R5 = H or alkyl; R6 = H; and R1R2 can form an alkyl bridge or an alicyclic ring). Thus, a solution containing Alnovol PN 430 (PhOH-HCHO resin), 3,5-dioxo-4-diazo-1,1-dimethylcyclohexane, Et glycol acetate, BuOAc, and xylene was coated on a Si wafer, dried, imagewise-exposed, and developed in aqueous NaOH to give a detailed reproduction of the original in the form of

a pos. relief.

IC G03C001-70; G03F007-08

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

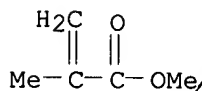
ST pos working photosensitive compn lithog; microlithog pos working

photoresist; alicyclic diazodiketone pos photoresist  
 IT Phenolic resins, uses and miscellaneous  
 RL: USES (Uses)  
 (pos.-working photoresists containing alicyclic diazo diketones and)  
 IT Resists  
 (photo-, pos.-working, containing alicyclic diazo diketones)  
 IT 9003-35-4, Alnovol PN 430  
 RL: USES (Uses)  
 (pos.-working photoresists containing alicyclic diazo diketone and)  
 IT 57-55-6, uses and miscellaneous 109-99-9, Tetrahydrofuran, uses and  
 miscellaneous 110-80-5, Ethyl cellosolve 123-86-4, Butyl acetate  
 123-91-1, Dioxane, uses and miscellaneous 1330-20-7, Xylene, uses and  
 miscellaneous  
 RL: USES (Uses)  
 (pos.-working photoresists containing diazo diketone and)  
 IT **25086-15-1**  
 RL: USES (Uses)  
 (pos.-working **photoresists** containing dioxodiazocyclohexane and)  
 IT 1807-68-7, 3,5-Dioxo-4-diazo-1,1-dimethylcyclohexane  
 RL: USES (Uses)  
 (pos.-working photoresists containing phenolic resin and)  
 IT 1460-08-8, 1,3-Dioxo-2-diazocyclohexane  
 RL: USES (Uses)  
 (pos.-working resists containing polymer binder and)  
 IT **25086-15-1**  
 RL: USES (Uses)  
 (pos.-working **photoresists** containing dioxodiazocyclohexane and)  
 RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

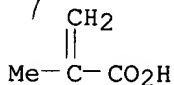
CMF C5 H8 O2



CM 2

CRN 79-41-4

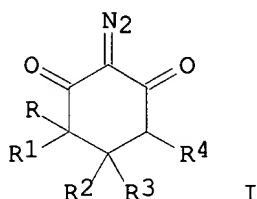
CMF C4 H6 O2



L59 ANSWER 37 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1987:506347 HCAPLUS  
 DN 107:106347  
 TI Deep ultra-violet **lithographic** resist composition

IN Schwartzkopf, George  
 PA Baker, J. T., Chemical Co., USA  
 SO Eur. Pat. Appl., 16 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 198674	A2	19861022	EP 1986-302677	19860410
	EP 198674	A3	19870902		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	US 4624908	A	19861125	US 1985-723273	19850415
	JP 61240237	A2	19861025	JP 1986-85220	19860415
	JP 03006495	B4	19910130		
PRAI	US 1985-723273	A	19850415		
GI					



AB A deep-UV pos. photoresist is comprised of a base-soluble polymer and a photosolubilizing agent having the general formula I (R4 = H, C1-20 alkoxy carbonyl) and when R4 = C1-20 alkoxy carbonyl, R-R3 = H, C1-6 alkyl; when R, R2 = H, R1R3 together are C1-6 alkylene; when R, R1 = H, CR2R3 is C5-9 cycloalkyl; when CRR1 = C5-9 cycloalkyl, R2, R3 = H). The photoresist is sensitive to 240-300 nm UV radiation and provides high-resolution patterns. Decalin-1,3-dione was reacted with triethylamine and p-toluenesulfonyl azide in EtOH in an ice bath to give trans-2-diazodecalin-1,3-dione (II). A solution composed of II, methacrylic acid-Me methacrylate copolymer, and 2-ethoxyethanol was coated on a Si wafer, dried, exposed to the 240-300 nm radiation from a high-pressure Hg lamp, and developed with an aqueous triethanolamine solution to remove the photoresist layer from the exposed areas.

IC ICM G03F007-08

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST pos UV photoresist diazocyclohexanedione deriv; photosolubilizer diazocyclohexanedione deriv pos photoresist

IT Resists  
 (photo-, pos.-working, deep-UV, containing base-soluble resin and diazocyclohexanedione derivative)

IT 9003-35-4, Phenol-formaldehyde copolymer 9016-83-5 **25086-15-1**,  
 Methacrylic acid-methyl methacrylate copolymer 59269-51-1,  
 Poly(vinylphenol)  
 RL: USES (Uses)

(pos.-working deep-UV photoresist from diazocyclohexanedione derivative and)

IT 7230-19-5 109970-15-2 109970-16-3 109970-18-5

RL: USES (Uses)

(pos.-working deep-UV photoresists from base-soluble resin and)



IT 941-55-9, p-Toluenesulfonyl azide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with decalindiones)

IT 4029-25-8 68429-52-7, Decalin-1,3-dione 109970-17-4  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with toluenesulfonyl azide)

IT 96-48-0,  $\gamma$ -Butyrolactone 108-10-1, Methyl isobutyl ketone  
 110-49-6, 2-Methoxyethyl acetate 110-80-5, 2-Ethoxyethanol 111-96-6,  
 Diglyme  
 RL: USES (Uses)  
 (solvent, for deep-UV pos. photoresist composition containing  
 alkali-soluble resin  
 and diazocyclohexanedione derivs.)

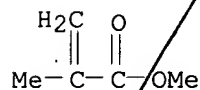
IT 25086-15-1, Methacrylic acid-methyl methacrylate copolymer  
 RL: USES (Uses)  
 (pos.-working deep-UV **photoresist** from diazocyclohexanedione  
 derivative and)

RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)

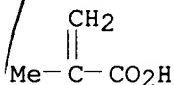
CM 1

CRN 80-62-6  
 CMF C5 H8 O2



CM 2

CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 38 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1987:224502 HCAPLUS

DN 106:224502

TI Deep ultraviolet **lithographic** resist composition

IN Gray, Gary M.

PA Baker, J. T., Chemical Co., USA

SO U.S., 4 pp. Cont.-in-part of U.S. Ser. No. 539,817 abandoned.  
 CODEN: USXXAM

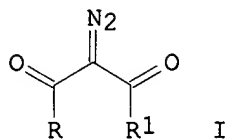
DT Patent

LA English

FAN.CNT 1

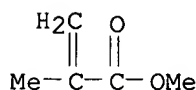
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 4622283	A	19861111	US 1985-775222	19850912

PRAI US 1983-539817 A2 19831007  
OS CASREACT 106:224502  
GI

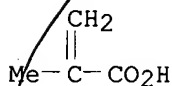


- AB A pos.-working UV photoresist which is developable in an alkaline solution is comprised of an alkali-soluble polymer and a photosolubilizing agent having the formula I (R, R1 = alkyl, aryl, alkoxyalkyl, aralkyl, haloalkyl, RR1 combination representing alkylene). The UV photoresist provides good **resolution** of 0.75  $\mu$  and is especially suitable for **lithog.** A solution of methacrylic acid-Me methacrylate copolymer, 2-diazo-5,5-dimethylcyclohexane-1,3-dione, and 2-ethoxyethyl acetate was coated on a wafer, dried, exposed to deep UV radiation, and developed in an alkaline developer. The photoresist required only 1/2 of the exposure dose to clear the exposed areas as compared to a control using a diazo compound outside the scope of the invention.
- IC ICM G03C001-54  
ICS G03C001-60; G03F007-26
- NCL 430191000
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)
- ST pos UV photoresist diazodiketone **lithog**
- IT Phenolic resins, uses and miscellaneous  
RL: USES (Uses)  
(alkali-soluble, pos.-working deep UV photoresist containing diazodiketone photosolubilizing agent and, for **lithog.**)
- IT Resists  
(photo-, UV, pos.-working, deep, containing alkali-soluble polymer and diazadiketone photosolubilizing agent for **lithog.**)
- IT 13407-52-8  
RL: USES (Uses)  
(diazotization of diketone with, for **lithog.** resist composition)
- IT 1807-68-7, 2-Diazo-5,5-dimethyl-1,3-cyclohexanedione  
RL: USES (Uses)  
(pos.-working deep UV photoresist containing alkali-soluble polymer and, for **lithog.**)
- IT 9003-35-4, Formaldehyde-phenol copolymer 9016-83-5, Cresol-formaldehyde copolymer **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer  
RL: USES (Uses)  
(pos.-working deep UV **photoresist** containing diazodiketone photosolubilizing agent and, for **lithog.**)
- IT 1460-08-8P 1807-68-7P 2009-96-3P 56540-48-8P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and use of, in deep UV **lithog.** resist composition)
- IT 96-48-0,  $\gamma$ -Butyrolactone 108-10-1, Methyl isobutyl ketone  
110-49-6, 2-Methoxyethyl acetate 110-80-5 111-96-6, Diglyme  
RL: USES (Uses)  
(solvent, for coatable photoresist containing alkali-soluble polymer and

diazodiketone photosolubilizing agent for lithog.)  
IT 25086-15-1, Methacrylic acid-methyl methacrylate copolymer  
RL: USES (Uses)  
(pos.-working deep UV photoresist containing diazodiketone  
photosolubilizing agent and, for lithog.)  
RN 25086-15-1 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)  
  
CM 1  
  
CRN 80-62-6  
CMF C5 H8 O2



CM 2  
  
CRN 79-41-4  
CMF C4 H6 O2



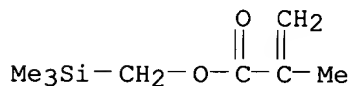
L59 ANSWER 39 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1987:165987 HCAPLUS  
DN 106:165987  
TI Trimethylsilylmethylmethacrylate-methacrylic acid polymer/2-nitrobenzyl  
cholate: a two-level, solution-inhibition, deep-UV resist system  
AU Reichmanis, E.; Smith, B. C.; Smolinsky, G.; Wilkins, C. W., Jr.  
CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA  
SO Journal of the Electrochemical Society (1987), 134(3), 653-7  
CODEN: JESOAN; ISSN: 0013-4651  
DT Journal  
LA English  
AB Trimethylsilylmethyl methacrylate (SI) and methacrylic acid (MA)  
copolymerize with reactivity ratios of .apprx.1 to give a material that  
has adequate aqueous-base-solubility and O-RIE resistance to serve as the top  
component of a bilevel resist system. A resin with a SI:MA ratio of 1.1:1  
etches between 1/10 and 1/20 slower than hard-baked HPR-204, depending on  
the O pressure in the reactor. Incorporation of 20 w/o dinitrobenzyl  
cholate to the resist layer, as a solution inhibitor results in a system  
capable of submicron resolution with a sensitivity of .apprx.0.2  
J/cm2. O-RIE pattern transfer into thick planarizing HPR-204 was readily  
accomplished.  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)  
ST trimethylsilylmethyl methacrylate methacrylic acid copolymer;  
lithog bilevel resist system  
IT Resists

- (photo-, deep-UV, 2-level, trimethylsilylmethyl methacrylate-methacrylic acid polymer/nitrobenzyl cholate system)
- IT 111-42-2, Diethanolamine, uses and miscellaneous  
RL: USES (Uses)  
(developer composition containing sodium hydrogen carbonate and, for **lithog.** characteristics of trimethylsilylmethyl methacrylate-methacrylic acid resists)
- IT 144-55-8, Sodium hydrogen carbonate, uses and miscellaneous  
RL: USES (Uses)  
(developer solution containing diethanolamine and, for characterization of trimethylsilylmethylmethacrylate-methacrylic acid polymer resists)
- IT 80500-54-5, 2-Nitrobenzyl cholate 85777-23-7, 2,6-Dinitrobenzyl cholate  
RL: USES (Uses)  
(**lithog.** 2-level resist system containing trimethylsilylmethyl methacrylate-methacrylic acid polymer and)
- IT 73928-57-1  
RL: USES (Uses)  
(**lithog.** 2-level solution-inhibitor deep-UV resist system with: poly(trimethylsilylmethyl methacrylate-methacrylic acid) photoresist-nitrobenzyl cholate upper layer and lower layer from)
- IT 102868-49-5, Trimethylsilylmethyl methacrylate-methacrylic acid copolymer  
RL: USES (Uses)  
(**photoresist** from, containing nitrobenzyl cholate solution inhibitor, for 2-level deep-UV **resist** system **lithog** .)
- IT 7782-44-7, Oxygen, properties  
RL: PRP (Properties)  
(plasma, reactive ion etching resistant to, by trimethylsilylmethylmethacrylate-methacrylic acid photoresist system)
- IT 102868-49-5, Trimethylsilylmethyl methacrylate-methacrylic acid copolymer  
RL: USES (Uses)  
(**photoresist** from, containing nitrobenzyl cholate solution inhibitor, for 2-level deep-UV **resist** system **lithog** .)
- RN 102868-49-5 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with (trimethylsilyl)methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 18269-97-1

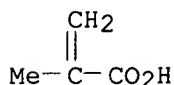
CMF C8 H16 O2 Si



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 40 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1987:129327 HCAPLUS

DN 106:129327

TI Photosensitive resin compositions

IN Araki, Yasuhiko; Matsuhi, Hajime; Danjo, Shigeru

PA Sekisui Chemical Co. Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 61188533	A2	19860822	JP 1985-30008	19850218
PRAI	JP 1985-30008		19850218		

AB The claimed photosensitive resin compns. contain (1) a resin prepared from  $\alpha,\beta$ -unsatd. ethylenic monomers, (2)  $\alpha,\beta$ -unsatd.ethylenic photocrosslinking agents, (3) thioxanthone or its alkyl or halo derivative, (4)  $\geq 1$  compound of the formula  $p\text{-R}_1\text{NR}_2\text{C}_6\text{H}_4\text{CO}_2\text{R}_3$  ( $\text{R}_1, \text{R}_2 = \text{C}_1\text{-3 alkyl}; \text{R}_3 = \text{H}, \text{C}\leq 18 \text{ alkyl}$ ), and (5)  $\geq 1$ 

2,4,5-triarylimidazolyl dimer. The photosensitive resin compns. show good sensitivity and good storage stability; hence they are useful as high-resolution photoresists for electroforming processes. Thus, poly(Me methacrylate), pentaerythritol triacrylate, tetraethylene glycol diacrylate, 2,4-diethylthioxanthone, isoamyl p-dimethylaminobenzoate, 2-(2-chlorophenyl)-4,5-bis(emthoxyphenyl)imidazole dimer, ethyl violet and p-methoxyphenol were mixed in MeCOEt to give a photoresist solution for electroplating resist pattern formation.

IC ICM G03C001-00

ICS C08F002-48; G03C001-68; G03F007-00

CC 74-4 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photoresist compn acrylic resin; triphenylimidazole dimer photoresist compn; alkylaminobenzoate ester photoresist compn

IT Electrodeposition and Electroplating

(photoresists for pattern formation by)

IT Resists

(photo-, acrylic resin compns. containing alkyl aminobenzoate esters and triarylimidazole dimers as)

IT Electric circuits

(printed, photoresists for lithog. fabrication of)

IT 3524-68-3, Pentaerythritol triacrylate 9011-14-7, Poly(methyl methacrylate) 17831-71-9, Tetraethylene glycol diacrylate

**25086-15-1**, Methacrylic acid-methyl methacrylate copolymer

82799-44-8, 2,4-Diethylthioxanthone

RL: TEM (Technical or engineered material use); USES (Uses)

(photoresist compns. containing)

IT **25086-15-1**, Methacrylic acid-methyl methacrylate copolymer

RL: TEM (Technical or engineered material use); USES (Uses)

(photoresist compns. containing)

RN 25086-15-1 HCAPLUS

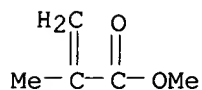
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate

(9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

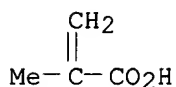
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 41 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1986:99539 HCAPLUS

DN 104:99539

TI Positive resist materials

IN Isori, Kunihiro; Onishi, Yasunobu; Hayase, Shuji

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

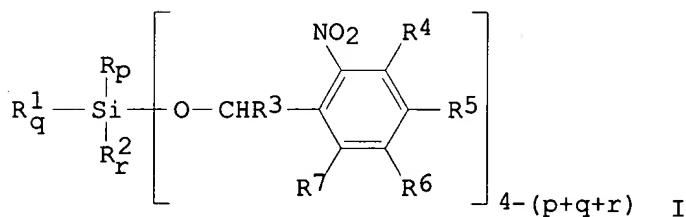
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 60189741	A2	19850927	JP 1984-45510	19840312
PRAI	JP 1984-45510		19840312		
GI					



AB Pos.-resist materials contain Me methacrylate-methacrylic acid copolymer and an o-nitrobenzyloxysilane derivative I (R-R2 = H, halo, vinyl, allyl,

C1-10 alkyl, C1-10 alkoxy, aryl, aryloxy, siloxy; R3 = H, C1-10 alkyl, Ph, R4-R7 = H, NO2, CN, OH, mercapto, halo, acetyl, allyl, C1-5 alkyl, C1-5 alkoxy, aryl, aryloxy; p, q, r = integers on condition that  $0 \leq p$ ,  $q, r \leq 3$ ,  $1 \leq p+q+r \leq 3$ ). The materials have good sensitivity to UV, especially in 200-300-nm range as well as to visible light and ionizing radiation, and good resistivity to dry-etching, and provide resist patterns having high **resolution**. Thus, 200 g solution of 15% Me methacrylate-methacrylic acid 75:25 copolymer (mol. weight 70,000) in cyclopentanone was mixed with 6 g o-nitrobenzyloxytriphenylsilane. After purification by filtration using a 0.5- $\mu$ m filter, the solution was spin-coated on a SiO2/Si wafer and dried at 140° for 20 min to give a 1.0-1.5  $\mu$ m resist layer. The resist layer was imagewise exposed to 250-nm light and developed with a 10% NaHCO3 solution

IC ICM G03C001-72

ICS G03C005-08

ICA C08K005-54; C08L033-12

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST nitrobenzyloxysilane deriv pos resist **lithog**; photoresist

nitrobenzyloxysilane acrylic polymer

IT Resists

(photo-, pos.-working, composition for, containing methacrylic acid-Me methacrylate copolymer and nitrobenzyloxysilane derivs.)

IT Resists

(pos.-working, composition for, containing methacrylic acid-Me methacrylate copolymer and nitrobenzyloxysilane derivs.)

IT 88216-15-3 97716-33-1 98064-93-8 100551-46-0

RL: USES (Uses)

(pos.-working resist composition containing Me methacrylate-methacrylic acid copolymer and)

IT **25086-15-1**

RL: USES (Uses)

(pos.-working **resist** composition containing nitrobenzyloxytriphenylsilane or its derivs. and)

IT **25086-15-1**

RL: USES (Uses)

(pos.-working **resist** composition containing nitrobenzyloxytriphenylsilane or its derivs. and)

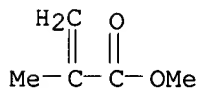
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

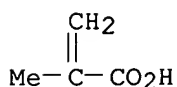
CMF C5 H8 O2



CM 2

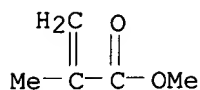
CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 42 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1986:99369 HCAPLUS  
DN 104:99369  
TI A small scale Z-pinch device as an intense soft x-ray source  
AU Weinberg, Irving N.; Fisher, Amnon  
CS Dep. Phys., Univ. California, Irvine, CA, 92717, USA  
SO Nuclear Instruments & Methods in Physics Research, Section A:  
Accelerators, Spectrometers, Detectors, and Associated Equipment (1986),  
A242(3), 535-8  
CODEN: NIMAER; ISSN: 0168-9002  
DT Journal  
LA English  
AB A small scale (400 J) device to study the application of radiation emitted  
by a plasma Z-pinch to microscopy and microlithog. was built. As a pulsed  
emitter of soft x-rays the Z-pinch is an inexpensive source for high  
**resolution** flash microscopy of thin films, and live and unstained  
biol. specimens. In the repetitive mode, radiation from the device was  
used to expose resists for microlithog. Windows of different plastics  
shielded the resists from debris and allowed exposure of resists in air.  
The use of different pinching gases allowed tunability of radiation.  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)  
Section cross-reference(s): 71, 73  
ST pinch Z x ray source; microscopy **lithog** plasma x ray  
IT X-ray  
(source, small scale Z-pinch device for)  
IT **Lithography**  
Resists  
(x-ray source for, Z-pinch device for)  
IT Pinch effect  
(Z-, x-ray source for microlithog. and microscopy)  
IT 9011-14-7 **25086-15-1** 25656-90-0  
RL: USES (Uses)  
(**lithog.** with, plasma Z-pinch device as x-ray source for  
**resist** layer of)  
IT **25086-15-1**  
RL: USES (Uses)  
(**lithog.** with, plasma Z-pinch device as x-ray source for  
**resist** layer of)  
RN 25086-15-1 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)  
CM 1  
CRN 80-62-6  
CMF C5 H8 O2

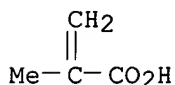




CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 43 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1985:103619 HCAPLUS

DN 102:103619

TI Bilevel resist

IN Reichmanis, Elsa; Smolinsky, Gerald

PA AT and T Bell Laboratories, USA

SO U.S., 8 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4481049	A	19841106	US 1984-585850	19840302
	JP 60229026	A2	19851114	JP 1985-40345	19850302
	JP 07099435	B4	19951025		
PRAI	US 1984-585850	A	19840302		
AB	A bilveel resist having the attributes of a trilevel resist and requiring significantly less processing contains an underlying layer formed with a conventional material such as a novolac resin baked at 200° for 30 min and an overlying layer including a Si-containing material such as a Si derivative of poly(Me methacrylate). By using this resist, excellent <b>resolution</b> in the <b>lithog.</b> fabrication of electronic devices can be achieved.				
IC	B44C001-22; C03C015-00; C03C025-06				
NCL	156643000				
CC	74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other <b>Reprographic</b> Processes) Section cross-reference(s): 76				
ST	methyl methacrylate polymer silicon deriv; bilevel photoresist				
IT	Resists (photo-, bilevel, containing silicon derivative of poly(Me methacrylate))				
IT	71685-29-5	91786-67-3	<b>91786-68-4</b>	91786-69-5	91786-70-8
	94977-23-8				
	RL: USES (Uses) ( <b>photoresists</b> containing, bilevel)				
IT	2530-85-0	15289-97-1	16085-37-3	17096-07-0	18151-85-4 18269-97-1
	19309-90-1	54586-78-6	95049-21-1		
	RL: RCT (Reactant); RACT (Reactant or reagent) (polymerization of)				

IT 91786-68-4

RL: USES (Uses)

(photoresists containing, bilevel)

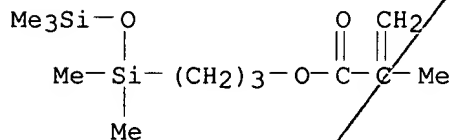
RN 91786-68-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with 3-(pentamethyldisiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 18151-85-4

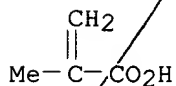
CMF C12 H26 O3 Si2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 44 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1985:87666 HCAPLUS

DN 102:87666

TI Sensitive positive electron beam resists

IN Douglas, Richard B.; Fure, Barbara J.; Lai, Juey H.

PA Honeywell Inc., USA

SO U.S., 7 pp. Cont.-in-part of U.S. Ser. No. 376,343, abandoned.

CODEN: USXXAM

DT Patent

LA English

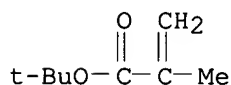
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4476217	A	19841009	US 1984-578987	19840213
PRAI	US 1982-376343	A2	19820510		

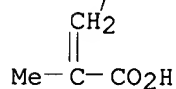
AB A pos. electron-beam resist containing methacrylic acid-tert-Bu methacrylate copolymer exhibits high sensitivity and excellent submicron **resoln**. Thus, a SiO<sub>2</sub> support was coated with a solution containing methacrylic acid-tert-Bu methacrylate (68.9/31.1 mol.% ratio) copolymer (.hivin.Mw 579,000, .hivin.Mn = 405,000) in Me cellosolve, prebaked at 200° for 30 min, imagewise exposed to electron-beam radiation, developed with a Me cellosolve-Me iso-Bu ketone (1:1) mixture for 40 s, and rinsed with iso-PrOH for 20 s. The resist sensitivity was 15 + 10<sup>-6</sup> C-cm<sup>-2</sup>. The images had min. swelling and the submicron lines possessed vertical walls.

IC B05D003-02; G03C005-16; G03C005-24

NCL 430326000  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
**Reprographic** Processes)  
 ST pos electron beam resist **lithog**; methacrylic acid butyl  
 methacrylate copolymer  
 IT Resists  
 (electron-beam, pos.-working, Bu methacrylate-methacrylic acid  
 copolymer, with high sensitivity and submicron **resolution**)  
 IT **35343-63-6P**  
 RL: PREP (Preparation)  
 (**lithog.** pos. electron-beam **resist**, preparation and  
 characterization of)  
 IT **35343-63-6P**  
 RL: PREP (Preparation)  
 (**lithog.** pos. electron-beam **resist**, preparation and  
 characterization of)  
 RN 35343-63-6 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl  
 2-methyl-2-propenoate (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 585-07-9  
 CMF C8 H14 O2



CM 2  
 CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 45 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1984:601296 HCAPLUS  
 DN 101:201296  
 TI Synchrotron radiation x-ray **lithography**  
 AU Haelbich, R. P.; Silverman, J. P.; Warlaumont, J. M.  
 CS Thomas J. Watson Res. Cent., IBM, Yorktown Heights, NY, 10598, USA  
 SO Nuclear Instruments & Methods in Physics Research, Section A:  
 Accelerators, Spectrometers, Detectors, and Associated Equipment (1984),  
 222(1-2), 291-301  
 CODEN: NIMAER; ISSN: 0168-9002  
 DT Journal  
 LA English  
 AB The construction of an x-ray **lithog.** beam line at a storage ring  
 includes a scanning, collimating mirror and a vacuum system with a Be  
 window for vacuum separation Wafers were exposed in a simple exposure chamber

to evaluate the illumination system and to test resist **resolution** and processing parameters. The results obtained for intensity, exposure time and **resolution** are discussed.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST synchrotron radiation x ray **lithog**

IT Resists

Resists

(in synchrotron radiation x-ray **lithog.**)

IT Synchrotron radiation

Synchrotron radiation

(x-ray **lithog.** using)

IT **Lithography**

(x-ray, synchrotron radiation, characteristics of)

IT 9011-14-7 **25086-15-1** 92940-45-9

RL: USES (Uses)

(**resist**, in synchrotron radiation x-ray **lithog.**)

IT **25086-15-1**

RL: USES (Uses)

(**resist**, in synchrotron radiation x-ray **lithog.**)

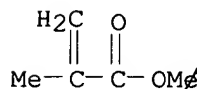
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

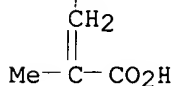
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 46 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1984:520357 HCAPLUS

DN 101:120357

TI Deep UV positive resists for two-level photoresist processes

AU Reichmanis, E.; Smolinsky, G.

CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1984), 469(Adv. Resist Technol.), 38-44

CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

AB Methacrylate polymers containing 0-17.5 weight% Si were prepared by polymerization of 3-methacryloxypropylpentamethyldisiloxane (DS), 3-methacryloxypropylbis(trimethylsiloxy)methylsilane (TS), or 3-methacryloxypropyltris(trimethylsiloxy)silane (QS) with Me methacrylate and methacrylic acid. **Lithog.** characteristics and etching rates (0 reactive ion etching) were determined for these polymers. A relatively low (6-10%) mol. fraction of siloxane ester was sufficient to effect a high degree of etching resistance. A 2-level resist structure using poly(DS-acrylic acid-Me methacrylate) containing 5.9% Si as a top photoreactive layer and HPR 204 as a planarizing layer, provided images with submicron **resolution**

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST photoresist methacrylate silicone polymer; oxygen etching mask photoresist system; silane methacrylate polymer photoresist **lithog**

IT Resists  
(photo-, pos.-working, deep-UV, for two-level processes, methacrylate polymers containing silicon as)

IT 73928-57-1  
RL: USES (Uses)  
(**lithog.** two-level photoresist process with structure containing methacrylate polymers containing silicon and)

IT 91786-67-3 **91786-68-4** 91786-69-5 91786-70-8  
RL: USES (Uses)  
(**photoresist**, for two-level **resist** processes, **lithog.** characteristics and oxygen reactive ion-etching **resistance** of)

IT 7782-44-7, uses and miscellaneous  
RL: USES (Uses)  
(reactive ion etching by, methacrylate polymers containing silicon resistant to, for two-level photoresist processes)

IT **91786-68-4**  
RL: USES (Uses)  
(**photoresist**, for two-level **resist** processes, **lithog.** characteristics and oxygen reactive ion-etching **resistance** of)

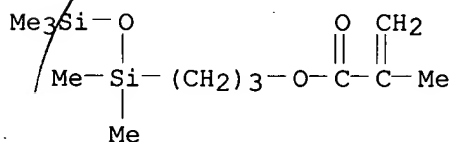
RN 91786-68-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with 3-(pentamethyldisiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 18151-85-4

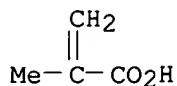
CMF C12 H26 O3 Si2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 47 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1984:501242 HCAPLUS

DN 101:101242

TI Positive resist image

IN Pfeiffer, Karl; Schulze, Ulrich; Rapsch, Brigitte

PA VEB ZFT Mikroelektronik Dresden, Ger. Dem. Rep.

SO Ger. (East), 10 pp.

CODEN: GEXXA8

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 209091	A3	19840418	DD 1981-235045	19811123
PRAI	DD 1981-235045		19811123		

AB Pos.-working resist materials for electron-beam and x-ray **lithog** having improved **resolution** and high sensitivity while at the same time having improved film formation, improved adhesion to various substrates, and improved etch resistance are composed of a solution of methacrylic acid-Me methacrylate copolymer in a monoalkyl glycol. The resist comps. are coated on substrates, exposed to ionizing radiation, developed with an alc. developer or developer mixture, and hardened. Thus, methacrylic acid-Me methacrylate copolymer, which had been purified by repeated solution in EtOH and precipitation with hexane, was dissolved in Me glycol,

the remaining volatile liqs. removed in a rotary evaporator, the solution filtered through a 0.2  $\mu\text{m}$  filter, and then coated on a support and dried at 200°. The resultant film was then electron-beam irradiated, developed with EtOH for 30 s, rinsed in MeCOEt or iso-BuCOMe, and hardened at 130° to 160° to show a sensitivity of 1.5 + 10-15 C-cm-2 and a contrast of 3.

IC G03C001-68; H01L021-312

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST x ray resist pos working; electron resist pos working; methyl methacrylate copolymer pos resist; methacrylic acid copolymer pos resist; alkyl glycol pos resist

IT Glycols, uses and miscellaneous

RL: USES (Uses)

(alkyl, electron-beam and x-ray resists containing methacrylic acid-Me methacrylate copolymer and)

IT Resists

(electron-beam, pos.-working, containing alkyl glycol and methacrylic acid-Me methacrylate copolymer)

IT Resists

(x-ray, pos.-working, containing alkyl glycol and methacrylic acid-Me methacrylate copolymer)

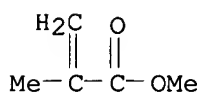
IT **25086-15-1**

RL: USES (Uses)

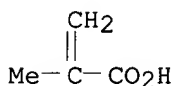
(electron-beam and x-ray **resist** comps. containing)

IT 109-86-4

RL: USES (Uses)  
 (electron-beam and x-ray resist compns. containing methacrylic acid-Me  
 methacrylate copolymer and)  
 IT 25086-15-1  
 RL: USES (Uses)  
 (electron-beam and x-ray **resist** compns. containing)  
 RN 25086-15-1 HCAPLUS  
 CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 80-62-6  
 CMF C5 H8 O2



CM 2  
 CRN 79-41-4  
 CMF C4 H6 O2



L59 ANSWER 48 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1984:77254 HCAPLUS  
 DN 100:77254  
 TI Contact **lithography** at 157 nm with a fluorine excimer laser  
 AU Craighead, H. G.; White, J. C.; Howard, R. E.; Jackel, L. D.; Behringer,  
 R. E.; Sweeney, J. E.; Epworth, R. W.  
 CS Bell Lab., Holmdel, NJ, 07733, USA  
 SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer  
 Structures (1983), 1(4), 1186-9  
 CODEN: JVTBD9; ISSN: 0734-211X  
 DT Journal  
 LA English  
 AB The 1st use is reported of a F2 excimer laser and a novel mask technol.  
 for high **resolution** photolithog. at 157 nm. With a contact  
**lithog.** technique resist lines as narrow as 0.15  $\mu\text{m}$  were made.  
 Because of the short wavelength involved, conventional mask technol. using  
 quartz substrates could not be employed. Alkaline earth halide substrates  
 (e.g.,  $\text{CaF}_2$ ) that have high transmittance at 157 nm were used as a base  
 for the mask production **Resolution** test masks were prepared by using  
 electron-beam **lithog.** and reactive ion etching to pattern a  
 polyimide film on the substrates. The development of **lithog.**  
 techniques at this wavelength is significant since the 157 nm radiation is  
 currently the deepest vacuum UV radiation available with high energy flux  
 from a readily obtained com. laser.  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other

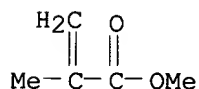
**Reprographic Processes)**

Section cross-reference(s): 76

- ST fluorine excimer laser contact **lithog**; photolithog fluorine excimer laser; mask technol contact photolithog; polyimide mask contact photolithog; calcium fluoride mask contact photolithog
- IT Photomasks  
(fabrication of, for contact **lithog**. with fluorine excimer laser)
- IT Semiconductor devices  
(fabrication of, mask technol. for contact **lithog**. with fluorine excimer laser in relation to)
- IT Polyimides, uses and miscellaneous  
RL: USES (Uses)  
(resist mask of, on calcium fluoride substrate, for contact **lithog**. using fluorine excimer laser)
- IT Resists  
(electron-beam, in mask production for excimer laser contact **lithog** .)
- IT Lasers  
(excimer, fluorine, for contact **lithog**.)
- IT **Lithography**  
(photo-, with fluorine excimer laser, mask technol. for)
- IT 7782-41-4, uses and miscellaneous  
RL: USES (Uses)  
(excimer laser, for contact **lithog**.)
- IT 9011-14-7  
RL: USES (Uses)  
(in mask fabrication for vacuum UV photolithog. using fluorine excimer laser)
- IT **25322-25-2**  
RL: USES (Uses)  
(**photoresist**, for vacuum UV contact **lithog**. using fluorine excimer laser)
- IT 7789-75-5, uses and miscellaneous  
RL: USES (Uses)  
(substrate, for contact **lithog**. mask for fluorine excimer laser source)
- IT **25322-25-2**  
RL: USES (Uses)  
(**photoresist**, for vacuum UV contact **lithog**. using fluorine excimer laser)
- RN 25322-25-2 HCAPLUS
- CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with 2-propenoic acid (9CI) (CA INDEX NAME)

CM 1

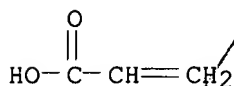
CRN 80-62-6  
CMF C5 H8 O2



CM 2



CRN 79-10-7  
CMF C3 H4 O2



L59 ANSWER 49 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1984:59538 HCAPLUS

DN 100:59538

TI Copolymers of itaconic acid and methyl methacrylate as positive electron beam resists

AU Namaste, Y. M. N.; Obendorf, S. K.; Anderson, C. C.; Krasicky, P. D.; Rodriguez, F.; Tiberio, R.

CS Dep. Design Environ. Anal., Cornell Univ., Ithaca, NY, 14853, USA

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1983), 1(4), 1160-5  
CODEN: JVTBD9; ISSN: 0734-211X

DT Journal

LA English

AB The copolymers of itaconic acid with Me methacrylate P(MMA-ItA), are expected to perform as highly sensitive electron-beam resists based on their high electron-beam chain scission efficiencies (Gs). The Gs for P(MMA-20% ItA) was 2.5 times that of PMMA, and the Gs for P(MMA-35% ItA) was nearly 5 times that of PMMA. The copolymers have exhibited improved thermal stability over PMMA, as indicated by a decomposition temperature for P(MMA-20% ItA) that is 30° higher than that of PMMA. IR analyses of the copolymers showed that anhydride formed during the prebake step of the lithog. evaluation. The anhydride was predominantly a 5-membered intramol. anhydride ring which formed within single monomeric itaconic acid units. Some intermol. anhydride was suspected because of the reduced solubility of the baked copolymers. The copolymer resists were synthesized to contain 20 and 35 mol% itaconic acid. Copolymers of each composition were evaluated with varying prebake conditions to provide varying amts. of anhydride formation. These resists were then evaluated on the basis of sensitivity, contrast, and resolution. Appropriate solvent systems for developing the lithog. patterns were chosen using a 3-dimensional solubility mapping technique based on polar, nonpolar, and H bonding solubility parameters. P(MMA-20% ItA), with a 160° prebake, exposed at  $7.5 \times 10^{-6}$  C/cm<sup>2</sup> with an accelerating voltage of 20 kV, was developed using a mixture of EtOAc and iso-BuCOMe without thinning of the unexposed resist. P(MMA-35% ItA) baked at 120° produced 1 μm wide images at 5 to 8 μC/cm<sup>2</sup> with a contrast (γ) of 2.5 to 3.5; 10% thinning was observed when developing areas exposed at 8 μC/cm<sup>2</sup>. Vertical walls were obtained at about 10 μC/cm<sup>2</sup>, and undercutting was observed with higher doses.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST itaconic acid methyl methacrylate polymer; electron beam resist polymer

IT Infrared spectra

(of itaconic acid-Me methacrylate polymer)

IT Resists

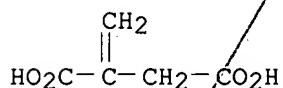
(electron-beam, itaconic acid-Me methacrylate polymers as)

IT 108-10-1 110-49-6 141-78-6, uses and miscellaneous

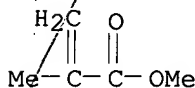
RL: USES (Uses)

(developer containing, for itaconic acid-methylmethacrylate polymer

electron resists)  
 IT 27155-24-4  
 RL: USES (Uses)  
 (pos. electron- beam resist)  
 IT 27155-24-4  
 RL: USES (Uses)  
 (pos. electron- beam resist)  
 RN 27155-24-4 HCAPLUS  
 CN Butanedioic acid, methylene-, polymer with methyl 2-methyl-2-propenoate  
 (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 97-65-4  
 CMF C5 H6 O4



CM 2  
 CRN 80-62-6  
 CMF C5 H8 O2



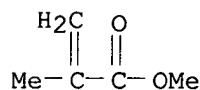
L59 ANSWER 50 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1983:135144 HCAPLUS  
 DN 98:135144  
 TI X-ray sensitive resists for submicron lithography  
 AU Aleksandrov, Yu. M.; Valiev, K. A.; Velikov, L. V.; Glebova, O. S.;  
 Gribov, B. S.; Dushenkov, S. D.; Mozzhukhin, D. D.; Pleshivtsev, A. S.;  
 Selivanov, G. K.; Yakimenko, M. N.  
 CS Fiz. Inst., Moscow, USSR  
 SO Mikroelektronika (1983), 12(1), 3-10  
 CODEN: MKETA9; ISSN: 0544-1269  
 DT Journal  
 LA Russian  
 AB Technol. and lithog. properties of the several pos. and neg.  
 x-ray resists were investigated using synchrotron radiation in 0.7-2.3 nm  
 region. Pos. resists were characterized by higher reduction and lower  
 sensitivity than the neg. resists. The resists recommended for submicron  
 x-ray lithog. were Me methacrylate-methacrylic acid copolymer (  
 resolution 0.05 μm) pos. resist and allyl monomaleate-vinyl ether  
 copolymer (resolution 0.5 μm) neg. resist. Introduction of Cu  
 into a polymer structure effectively increased resist sensitivity. For  
 example 8 fold sensitivity increase was observed with a 5.2 weight% increase of  
 Cu content in Me methacrylate-methacrylic acid copolymer.  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)

ST x ray lithog resist **resoln** sensitivity; copper x ray  
resist polymer  
IT Resists  
(x-ray, for submicron lithog., resolution and  
sensitivity of)  
IT 9011-14-7 **25086-15-1** 25951-87-5 26141-88-8 26591-04-8  
85192-78-5 85192-79-6  
RL: USES (Uses)  
(x-ray **resists** for submicron lithog.,  
characteristics of)  
IT 7440-50-8, uses and miscellaneous  
RL: USES (Uses)  
(x-ray sensitive polymeric resists for submicron lithog.  
containing, concentration effect on sensitivity increase of)  
IT **25086-15-1**  
RL: USES (Uses)  
(x-ray **resists** for submicron lithog.,  
characteristics of)  
RN 25086-15-1 HCAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate  
(9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

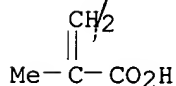
CMF C5 H8 O2



CM 2

CRN 79-41-4

CMF C4 H6 O2



L59 ANSWER 51 OF 51 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1983:9945 HCAPLUS  
DN 98:9945  
TI **Lithographic** evaluation of an o-nitrobenzyl ester-based deep UV  
resist system  
AU Wilkins, C. W., Jr.; Reichmanis, E.; Chandross, E. A.  
CS Bell Lab., Murray Hill, NJ, 07974, USA  
SO Journal of the Electrochemical Society (1982), 129(11), 2552-5  
CODEN: JESQAN; ISSN: 0013-4651  
DT Journal  
LA English  
AB Preliminary expts. with a new deep UV (230-300 nm) pos. resist based on  
the resin-solution inhibition mechanism were previously reported. The resin

was an optically transparent copolymer of Me methacrylate and methacrylic acid soluble in alkaline developers but protected from dissoln. by a photosensitive solution inhibitor. The latter was one of a family of o-nitrobenzyl esters of large-mol. organic acids such as cholic acid. This resist system was capable of 0.5  $\mu\text{m}$  **resolution** and had unusually high contrast ( $\gamma > 5$ ). A detailed **lithog.** evaluation of this 2-component system is described. Parameters such as copolymer mol. weight, o-nitrobenzyl ester concentration, and developer composition are examined and related to sensitivity and contrast. Reactive ion etching rates are comparable to those of HPR-204 resist.

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other **Reprographic** Processes)

ST nitrobenzyl cholate methyl methacrylate polymer; photoresist resin soln inhibition mechanism

IT Resists  
(photo-, pos.-working, resin-solution inhibition mechanism-based, Me methacrylate-methacrylic acid copolymer-nitrobenzyl cholate system as, sensitivity and contrast of)

IT 111-42-2, uses and miscellaneous 497-19-8, uses and miscellaneous 584-08-7  
RL: USES (Uses)  
(photoresist system based on resin-solution inhibition mechanism developed with, sensitivity and contrast in, concentration effect on)

IT **25086-15-1**  
RL: USES (Uses)  
(**photoresist** system containing nitrobenzyl cholate and, sensitivity of)

IT 80500-54-5  
RL: USES (Uses)  
(photoresist system containing poly(Me methacrylate-methacrylic acid) and, sensitivity of)

IT **25086-15-1**  
RL: USES (Uses)  
(**photoresist** system containing nitrobenzyl cholate and, sensitivity of)

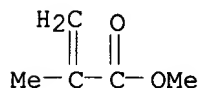
RN 25086-15-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

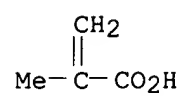
CRN 80-62-6

CMF C5 H8 O2



CM 2

CRN 79-41-4  
CMF C4 H6 O2



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